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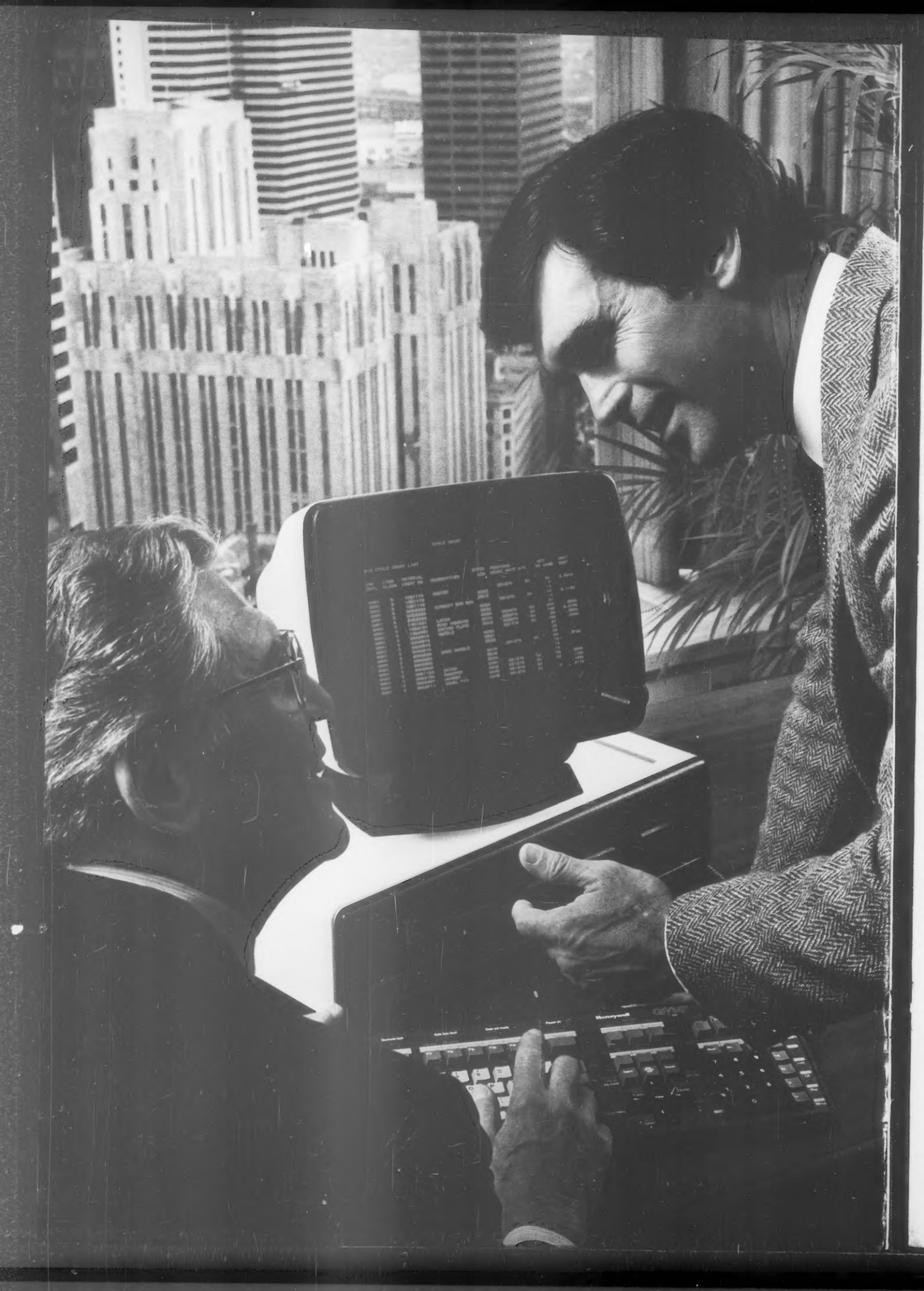

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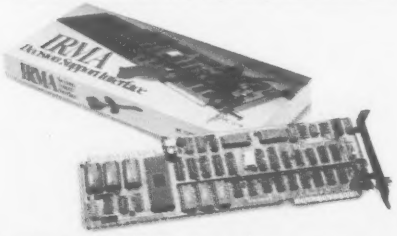

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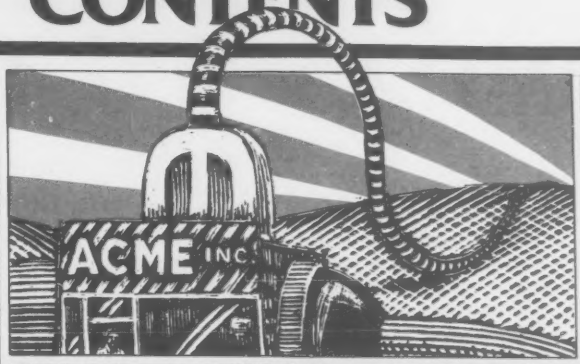

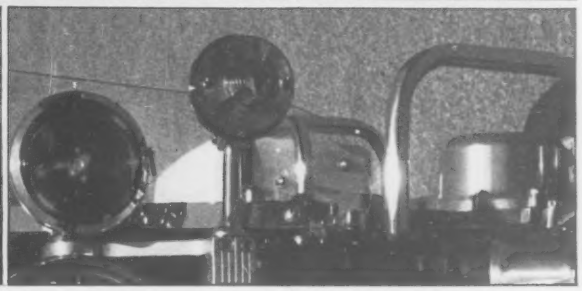

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The time has come to start thinking about electronic etiquette. In every other area in which we communicate — offices, classrooms, mealtimes, even cocktail parties, and, of course, the telephone — we have established conventions and cues that allow us both to exchange information and feelings and to respect each other's individuality and privacy. By the time we are adults, we have developed dozens of formalities and unconscious cues centered around the use of the telephone. However, in the face of electronic message systems, most of us are still as inexperienced as children.

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Washington, D.C.

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Manager, Engineering
Projects Control
Southeastern Michigan
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Detroit, Mich.

FORUM

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This list is hardly comprehensive. Do you have any suggestions for a guide to computer manners?

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Windt is an assistant to the publications group at Stanford University's Center for Information Technology.

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Windt is an assistant to the publications group at Stanford University's Center for Information Technology.

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NEWSBRIEFS

WASHINGTON, D.C. — Video display terminals will not damage vision. This was the finding of a panel of experts assembled by the National Research Council to address the effects of CRT terminals on office workers.

The study was requested by the National Institute for Occupational Safety and Health (Niosh). Although 40% to 80% of CRT terminal operators questioned in various surveys have complained about eyestrain or other visual problems, the panel found, little evidence exists that their symptoms differ from those of workers engaged in other close visual tasks. The panel called the problems "an annoyance to workers," but claimed such problems were not lasting ones.

The findings follow a two-year review of the problem. The panel concluded that workers' complaints more likely stemmed from poorly designed terminals, poorly lighted work places and boring repetitive jobs.

"Video Displays, Work and Vision" is available for $14.50 from National Academy Press, Room 700, 2100 Pennsylvania Ave. N.W., Washington, D.C. 20418.

WILLOW GROVE, Pa. — Fifteen office automation/administrative support job categories had salary increases over the last year, according to "The Ninth Salary Survey Results" published by the Association of Information Systems Professionals (Aisp). The report showed increases of 12.5% in the U.S. and 21.5% in Canada.

The results, based on a survey of Aisp members, were for 15 job categories ranging from WP trainee to administrative support manager. The highest salary increases were for the positions of phototypesetting and WP trainer.

The survey is available for $40 ($25 for Aisp members) from Aisp, 1015 N. York Road, Willow Grove, Pa., 19090.

MADISON, Wis. — People who work at CRTs complained more about working conditions — job design, underutilization of skills, decreased supervisory and staff support and less job autonomy — than those who did not use CRTs, according to a study by researchers at the University of Wisconsin Medical School's Department of Preventive Medicine.

CRT users found their workstations less pleasant; chairs less comfortable; and odors, dust and crowding more irritating than did their counterparts who did not use CRTs. They also complained slightly more than nonusers about eye irritation and back, neck and shoulder strain. The report, supported in full under contract from the National Institute for Occupational Safety and Health (Niosh), was done under the guidance of Steven Sauter, an industrial psychologist at the University of Wisconsin.

More information is available from Prof. Steven Sauter, Department of Preventive Medicine, University of Wisconsin, 504 N. Walnut St., Madison, Wis. 53706.

MELBOURNE, Fla. — Harris Corp. has agreed in principle to acquire Lanier Business Products, Inc. via a stock swap. Harris will reportedly issue .525 shares of its common stock for each of Lanier's approximately 16.2 million common shares outstanding. The total cost of the deal, based on current Harris stock prices, could be more than $370 million.

The transaction, which is subject to approval by shareholders of both companies, is expected to be confirmed this fall, according to a Harris spokesperson.

Harris said that Lanier would operate as a subsidiary under its own corporate name.

ARMONK, N.Y. — IBM has paid $228 million for a 15% interest in Rolm Corp., a leading maker of telephone switching devices.

In making this move, IBM said, it has chosen Rolm as its partner to link computers with telephones in the electronic office. The agreement calls for the two companies to work out ways for IBM computers to operate with Rolm private branch exchanges.

The Rolm agreement is the second IBM has made with a Santa Clara, Calif., technology company. In December, IBM agreed to pay $250 million for a 12% interest in Intel Corp., a leading semiconductor maker.

NEW YORK — Word processing/information systems placements with traditional secretaries (who type, answer phones and provide other administrative support) have increased over the past two years, according to a recent survey by Stevenson & Hanson Research Group, Inc., an opinion research firm.

The survey showed that 26% of the approximately 8,000 WP/information systems workstations reported by 500 respondents are placed with traditional secretaries. This figure is up from 14% in a similar survey done two years ago. The survey also showed a decrease in the centralization of WP equipment and an increase in walk-up WP workstations located in "common" areas.

The report is available for $8,500 from Stevenson & Hanson Research Group, Inc., P.O. Box 357, Setauket, N.Y. 11733.

NEW YORK — The market for

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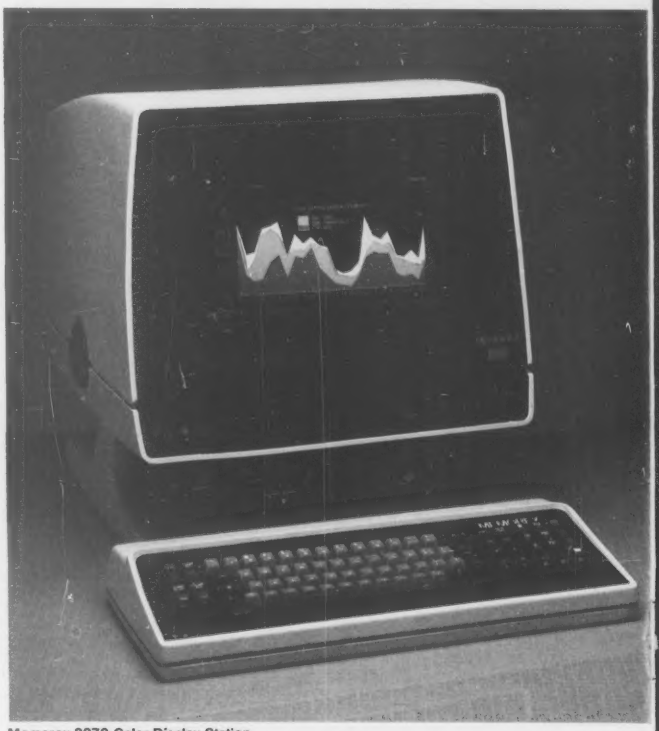

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NEWSBRIEFS

on-line information services is still largely untapped in many business/occupational categories, according to a survey Link Consulting Group did of electronic information users and department heads in more than 1,000 U.S. companies. According to "Business Users of Electronic Information Services," the average penetration of electronic information services across the total user sample is between 10% and 15%.

The study may be purchased in full for $12,000 or by selected sections starting at $5,000. More information is available from Link, 215 Park Ave. S., New York, N.Y. 10003.

NORWALK, Conn. — With the divestiture of AT&T, the soon-to-be-independent Bell operating companies will help push the stagnant voice store-and-forward market to $1.2 billion by 1993, according to a 138-page report from International Resource Development, Inc.

The study, "Store & Forward Voice Switching," points out that the Bell operating companies will license AT&T's VSS technology and offer it as part of their regular telephone services, netting them some $275 million annually by that time.

The report is available for $1,485 from International Resource Development, 30 High St., Norwalk, Conn. 06851.

WELLESLEY, Mass. — IBM led all manufacturers in worldwide shipments of small business computers in 1981, according to a recent study by Venture Development Corp. With nearly 22% of the market, IBM outdistanced Digital Equipment Corp., NCR Corp. and Wang Laboratories, Inc.

"Small Business Computer Sales and Distribution: A Strategic Analysis" defines small business computers as stand-alone systems with I/O devices, main memory, mass storage devices and end-user prices under $100,000. The report is available for $2,490 from Venture Development Corp., One Washington St., Wellesley, Mass. 02181.

WILLOW GROVE, Pa. — Office clerical employees in 1983 are averaging salary increases of 7.4% in the U.S. and 10.5% in Canada, according to the 37th annual office salaries survey conducted by the Administrative Management Society (AMS).

Published in the *1983-84 Office Salaries Directory*, the survey represents 20 clerical positions, including four secretarial and two word processing. The survey reports on 357,669 employees with 5,217 companies in 117 North American cities.

The study is available for $90 from AMS, 2360 Maryland Road, Willow Grove, Pa. 19090.

FRAMINGHAM, Mass. — The phenomenal growth and rapid introduction of office automation and personal computers into all levels of the business organization has, in many cases, allowed fragmented selection of dissimilar equipment, a report by International Data Corp. (IDC) pointed out. This situation has resulted in multivendor equipment configurations within many DP departments, forcing management information systems executives to integrate incompatible computing equipment.

In "Strategies for Integrating Multivendor Environments," IDC points out key areas of concentration for organizations that want to achieve successful system integration.

The report is available for $2,500 from IDC, 5 Speen St., Framingham, Mass. 01701.

BOSTON — A Yankee Group Pulse study of corporate purchases of desktop and personal computers shows "remarkably low levels of actual use" — more than two-thirds of the respondents used their desktop computers less than one-half hour per day.

More than 25% of the respondents said they currently have no desktop computers at their sites, but only 3.9% believe that will still be true of their location in 1985.

The Pulse study is available for $8,500 for a four-volume set. Yankee Group said from 89 Broad St., Boston, Mass. 02110.

BOSTON — Unix will become the standard operating system for minicomputers and 16-bit microcomputers, the Yankee Group predicted in a recent report.

The Yankee Group believes users would benefit enormously from the standardization of a truly optimal, highly portable office automation operating system. The group also estimates that by 1986, the Unix OA market will be valued at over $2 billion.

The report is available for $950 from the Yankee Group, 89 Broad St., Boston, Mass. 02110.

WILLOW GROVE, Pa. — The 1983 *Directory of Office Information Systems, Reference and Buyer's Guide* has been published by the Association of Information Professionals (Aisp).

The book is a guide to office information systems equipment, software, supplies and services designed to aid professional managers.

The updated directory sells for $34.95 from Aisp, 1015 N. York Road, Willow Grove, Pa. 19090.

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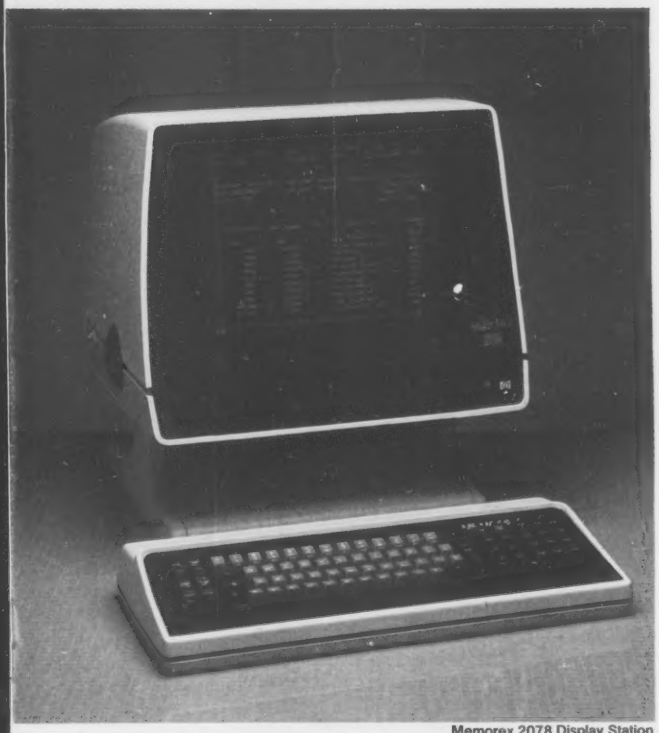

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Microcomputers: A Delicate Balance

Before buying, potential micro users should be aware of a wide range of features — both good and bad.

By Betty Feezor

PHOTO © 1983 GEORGE DILLON

Microcomputers alone may not always give the productivity increases users are looking for. In many organizations, mainframes will prove to be the missing link between the micro and increased management productivity. Before plunging into the micro waters head first, users should be aware of certain drawbacks and disadvantages that lie hidden there.

The effectiveness of large-scale automation with microcomputers is dependent upon a well-planned implementation. The many different versions and variations of hardware increase the danger of purchasing incompatible equipment, and in software, the picture is similarly confusing. One must examine the user's needs and then evaluate hardware, operating system compatibility and communications requirements.

Only a few vendors can provide the guidance, service and technical support required to implement microcomputer management solutions in a large organization. It pays to work with a vendor that deals in standard configurations, offers integrated software with mainframe access and has the resources and experience to support large-scale microcomputer implementation.

Storage capacity also influences large-scale implementation of microcomputers, which have a relatively small storage volume. The two standard 5½-in. double-density disk drives may require a management information center to be equipped with many diskettes, for both software and data files. An executive with access to the usual management software options — WP, spreadsheet, business graphics, data management, electronic mail and mainframe access — may need as many as 10 system diskettes, in addition to a data diskette for each application.

Many people responsible for planning management information centers supplement the standard configuration with a fixed-disk storage device. Many of these fixed disks are available and they increase storage capacity up to 30 times that of two double-density floppy diskettes. They also greatly increase the micro's reliability and overall convenience.

Although fixed-disk systems do contribute significantly to reliability, operators of microcomputer management information centers each assume responsibility for routine operations normally considered DP department functions. These routine responsibilities include backup procedures, recovery procedures, file maintenance and a basic understanding of hardware.

In an organization with hundreds of management information centers, some users will perform these maintenance procedures better than others. Consequently, as management moves into OA, the human interface becomes all important. The manager must be a responsible user of the microcomputer or full productivity benefits may not be realized.

Perhaps the major issue to consider when evaluating large-scale implementation of micros for management is cost.

For example, in the automation of secretarial workstations, new equipment replaces old, and the initial cost is justified in part by additional functions the secretary is able to perform. In management's case, however, the microcomputer is not replacing any major piece of equipment. The various functions performed are secondary. The primary objective of a management information center is information access or the availability of timely, accurate information.

Consequently, adding micros to managers' desks represents a significant initial capital investment. A minimal microcomputer hardware configuration costs from $3,000 to $5,000; when peripherals are added, that figure may reach $10,000.

Micro software is the greatest variable. It ranges from $250 for a typical WP package to $5,000 for a comprehensive software package, which includes six or seven sophisticated applications plus mainframe access capability. For the large organization, the latter package is the only viable alternative; if multiple units are purchased, the price is reduced by $2,000 or more per unit.

A large company purchasing 500 management information centers may invest as much as $600,000 in software alone. Average hardware costs for 500 units may run $1.5 million. Obviously, large-scale micro automation for management is a costly venture, but the decreasing cost of new technology makes the micro a more attractive alternative.

Why, then, are many large companies purchasing from 200 to 500 management information centers at one time? First, because of the micro's simplicity and flexibility; second, because when it is accompanied with integrated software, including mainframe access, the microcomputer can dramatically increase management productivity.

One of the micro's most obvious advantages is its simplicity. Installation, for example, is usually performed by the customer, in a manner not appreciably different from the way it would occur if a personal computer were found under the Christmas tree.

A large company purchasing 500 management information centers may invest as much as $600,000 in software alone. Average hardware costs for 500 units may run $1.5 million. Large-scale micro automation is a costly venture, but the decreasing cost of technology makes the micro a more attractive alternative.

Sometimes, however, special communications problems require technical assistance. Vendors currently employ one of two philosophies. Some provide a complete package of all software and required equipment. Others who provide only the software also include detailed documentation on required equipment to enable the customer to purchase correct hardware and additional communications equipment.

Another area in which the simplicity of the micro is apparent is user documentation, which is also easier to understand. Manuals are written as if the user knows nothing about computers. As a result, extensive training is not necessary. The systems themselves are generally easy to use because they are menu-driven and prompt the user for plain English commands. This element of simplicity makes the microcomputer an obvious choice for large-scale automation.

However, the primary reason for the micro's increasing popularity in large corporate environments is the availability of integrated application software.

The image of micros in business still reminds us of the secretary's word processor, but now it is the manager who is discovering the word processor — and more. Executives are abandoning yellow legal pads and producing professionally formatted documents in the same amount of time it takes to produce rough hand-written copy. In addition, these documents can then be transmitted to other terminals, printers or remote locations by telecommunications.

With integrated software, the microcomputer also becomes a financial spreadsheet, and other software packages such as business graphics enable the manager to construct multicolor charts and graphs directly on the microcomputer screen or on a graphics plotter.

However, without mainframe access, this integrated approach to microcomputer software provides only the manipulative tools for management analysis. Productivity increases are only marginal if managers do not have access to the large body of information in the mainframe data base and the ability to transfer that information to the micro.

Information-transfer software enables the microcomputer to become an intelligent on-line mainframe terminal. The microcomputer management information center then provides a window to on-line information on the mainframe. It also provides a means of capturing units of mainframe information and transferring that information to the micro, where it can be managed with any of the micro software packages.

Software now available from mainframe vendors will allow mainframe data base information to be sent to the microcomputer, where it can be edited with the WP system or the spreadsheet. Moreover, the graphics software can be used to produce a visual representation of that same mainframe information, thus providing yet another management tool to enhance the understanding of business information.

For example, assume a manager is planning an annual presentation to a superior on the financial status of a particular department. The department was $20,000 over budget, which represents a 15% increase. However, department revenues increased by 40%. The manager fears that only the cost overrun issue will be seen, and that company officials will not recognize the department's performance or future potential.

What can the manager do? He can access the exact figures from the general ledger on the company's mainframe and then transfer only those figures pertaining to the particular department to the micro. When it is in the micro, the mainframe information can be formatted and printed. Or the manager may wish to produce a bar graph or pie chart illustrating the relationship between the expenses and resultant profits. Additional graphs projecting future profits and expenses may strengthen the manager's argument and illustrate both sides of the issue more clearly.

This micro/mainframe information transfer is only in its infancy. Mainframe software vendors on the leading edge of this technology will soon offer even more sophisticated information-transfer software. The user of a management information center will be able not only to transfer information from the mainframe to the microcomputer, but also to transfer the manipulated information back to the mainframe, where the central data base will then be updated. This unique transfer system will dramatically increase the capabilities of the microcomputer and promises to have a parallel effect on productivity.

When a management information center possesses mainframe access capability, the limitations normally associated with the micros vanish. The problem of dealing with untimely data is resolved because management has access to current on-line data at any time. When the micro is capable of sending information back to the mainframe, the problem of timely updating will also be resolved.

Through this integrated approach to application software, management has a variety of ways to manipulate information for reports, presentations, analysis and decision making. The output of information is much faster than requesting printouts from the DP department, only to receive them the following day. Through electronic mail, communications are also more efficient, thus improving productivity.

Another less obvious benefit of automation for executives is its effect on management. Manager's computer literacy is expanded, and this, in turn, increases their overall understanding of OA and makes them more perceptive and responsive to future technological innovations.

Management has been the last area of large business to pursue office automation. Now, through the use of the microcomputer and integrated software packages, executives are recognizing the microcomputer is a powerful management instrument. As new technology provides more sophisticated communications capabilities, the microcomputer is sure to become a standard piece of management equipment. OA

Feezor is product manager of Atlanta-based Management Science America, Inc.'s newly announced software product line, integrating mainframe and microcomputer technology.

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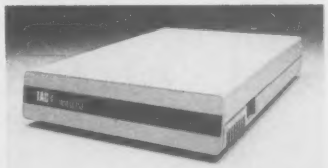

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THE OFFICE OF THE FUTURIST

AN INTERVIEW BY GLENN RIFKIN

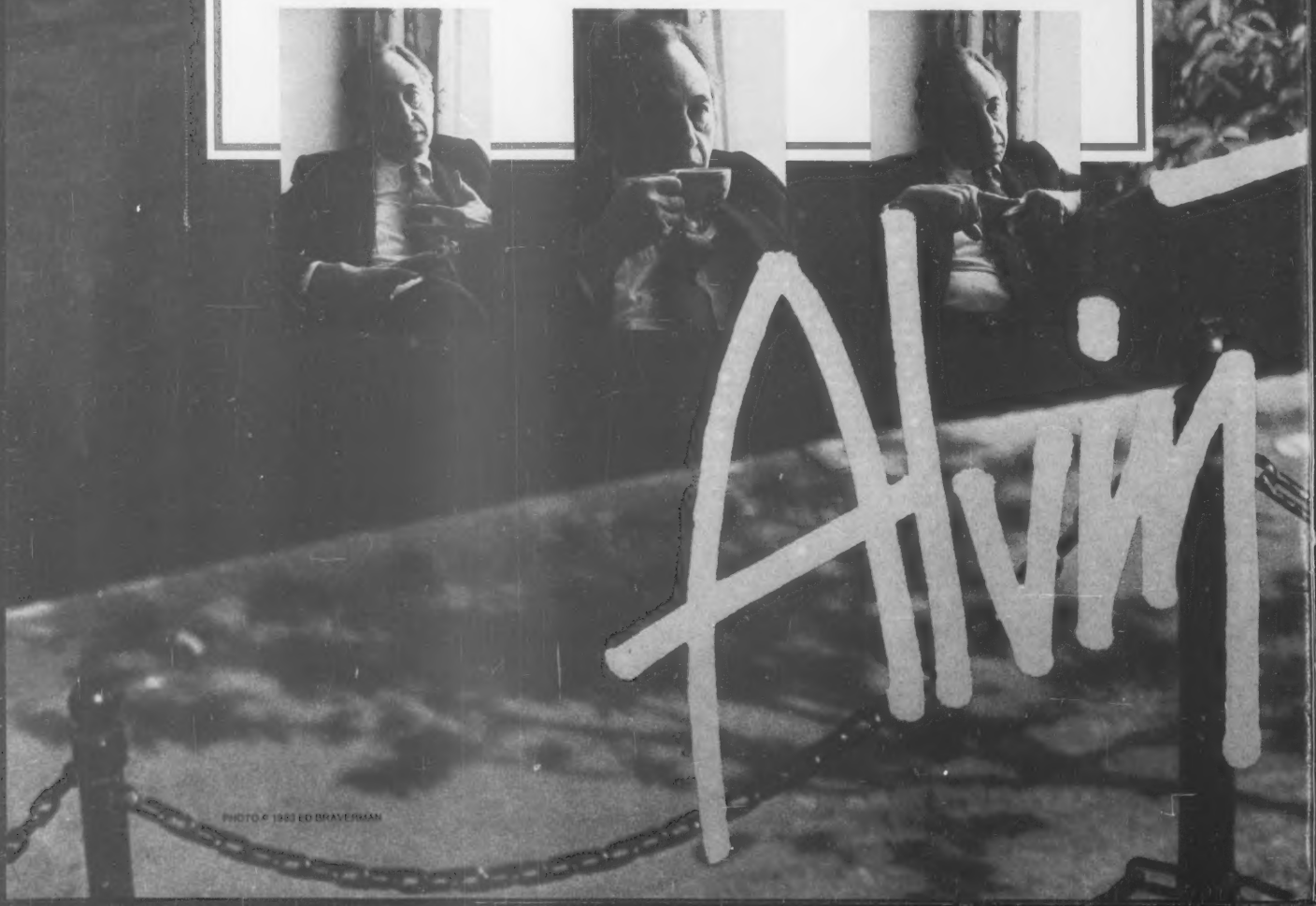
Alvin Toffler, author of the best-selling books *Future Shock* and *The Third Wave*, has had a major impact worldwide. He has been called a futurist, writer, social critic and soothsayer. His views and predictions about society, the economy, the information age, technology and the future have sold nearly 10 million books and made Toffler a sought-after lecturer and consultant. He has addressed groups in the U.S. Congress, the White House, the Japanese Diet and the British House of Commons.

A former associate editor of *Fortune* magazine, Toffler taught at Cornell University and the New School of Social Research before gaining international attention in 1970 with the publication of *Future Shock*. A decade later, his status as a sharply insightful critic and analyst soared when *The Third Wave* was published.

The Third Wave points out the "general crisis" in the world's industrial society and describes the transition from what Toffler calls "first-wave" society, or the agricultural revolution of 10,000 years ago, to the industrial revolution or "second wave" of 300 years ago.

From the political and social strife of the second wave, Toffler maintains, came a new revolution, the information age. This revolution is taking shape right now, with vast changes in all aspects of social, political, technological and economic life. *The Third Wave* points to a society turning away from second-wave values and decentralizing or "demassifying" on all fronts.

In *The Third Wave* and his new book, *Previews and Premises*, Toffler focuses on such subjects as the rapidly changing concepts of jobs, working and the work environment.



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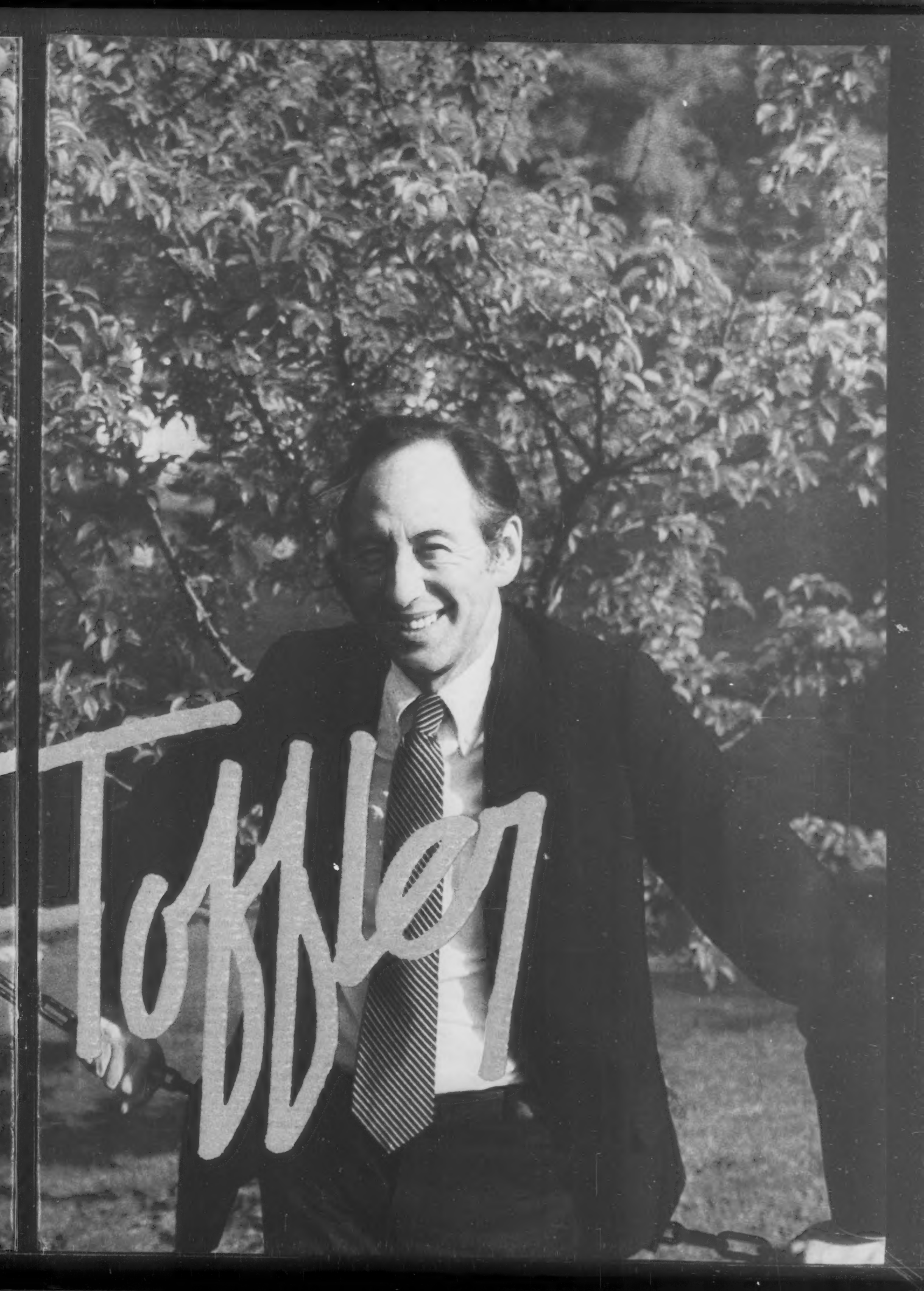
Tobler

On a recent visit to Boston, Toffler met with Computerworld OA's staff writer, Glenn Rifkin, to discuss office automation and its impact on the organization and the worker.

In *The Third Wave*, you referred to the concept of the office of the future as "too neat, too smooth, too disembodied to be real." What is your vision of the office of the future?

The image emerging from the hype is of a completely paperless and peopleless office where images flicker silently, decisions get made and things get done. Although there may be a movement in that direction, the idea of a humanless system is silly.

We're still going to have people and they'll have the same emotional problems people have always had. There are going to be contradictions and surprises, not a smooth flow of data moving through some silent office at the top floor of some skyscraper.

The office, first of all, will likely be smaller, less factory-like and more human. There will be increasing pressure and attention to health standards. People who try to use the new systems like a mass production factory are, in fact, either misusing the systems or misusing the people.

Office automation companies are so busy selling the machines that they underestimate the human side of the problem — the intelligent resistance to change. Organizations ought to be taking a long look at the human problems — changing statuses, jobs, work divisions, hierarchy and who wins and who loses — long before any piece of machinery ever arrives in the shop.

How far along are we in the automated office?

I think we're just beginning. Aside from the big companies, we haven't yet absorbed word processors into the system, let alone networking. We've got a long way to go.

But there also is a frenetic almost fad-like quality to what's going on. Advertising budgets are tremendous as vendors necessarily jockey for position in the marketplace. A lot of them won't make it, so there's a special frenzy to it.

The tone and sound of it will be different in two or three years when this initial phase is completed, the shakeout begins and experience begins to pile up.

What is scaring people? Is it the tone of the predictions more than what the reality could possibly be?

People are always afraid to adopt a new technology and change their ways. That was a remote fear, a sort of unfounded fear. Now a lot of people are unemployed — that's very concrete, very recognizable.

What's scaring people is 10 million unemployed. There are two things, actually.

People are always afraid to adopt a new technology and change their ways. That was a remote fear, a sort of unfounded fear. Now a lot of people are unemployed — that's very concrete, very recognizable. Many people are thinking "if this is the way it's going to be, and I'm going to live constantly under the fear of unemployment, then I don't want those machines. I'll do everything I can to prevent them from coming."

That's a losing strategy. We should and will employ new technologies. When we do, we've got to have certain political and social goals. We have to make a human office, not just an office. And we have to use technologies that tend toward decentralization rather than centralization. We need to be aware of the potential political uses of the technology.

If the companies selling the technology aren't going to face those problems, other people will — with great passion and sometimes without very much knowledge of what they're fighting.

With the company looking for one thing and the vendor another, who is going to watch out for the worker in terms of OA?

The workers are going to watch out for themselves pretty soon. In the initial phase, everyone is surprised by the existence of word processors and new equipment. Some people immediately resist the change, and others look at it with sort of a "Gee whiz, isn't that wonderful" attitude. But, as with any technology, the bugs begin to appear and a breaking-in period follows. There will be a shakedown period. Not just a shakeout of companies — which there will also be — but a shakedown of the various technologies.

In *The Third Wave*, you mentioned the decentralization of society. In many ways, OA would seem to be at odds with that. How do you resolve such a conflict?

Management must move beyond its second wave or industrialized management style. Typing pools or WP centers, for example, are highly unimaginative uses of those technologies. Inevitably they will bring resistance and opposition.

Why the big push for office automation now? The industrialization of America produced mass production, mass consumption, mass everything. But since 1955, we have begun to go the other way. From mass production, we have moved increasingly to customized short-run production. That's the process of demassification I described in *The Third Wave*.

At the same time, we began to break the mass consumer marketplace into increasingly smaller segments. We're changing the distribution from supermarkets to boutiques; the ultimate boutique is the home.

At every level, society is moving to a higher level of differentiation, becoming an internally more complex system.

What does that have to do with office automation? A lot. The more complex the components of the system, the more information you'll have to exchange. When we were a mass society, we had to exchange more information than the local villager does in an agricultural system. When we went to the industrial revolution, we invented the mass media, telephone and various communications tools to handle an increased information load.

Now we're at another revolutionary moment. Social structures are going from the relatively low diversity of mass society to the relatively high diversity of the demassified society.

As we move to a higher diversity, we need more information to predict the behavior of other units. As a result, file cabinets begin to be overloaded. Pretty soon, the clerks are going crazy and the bureaucracy is unable to keep up with the paperwork. And then from nowhere, word processors, computers and telecommunications appear.

What we're doing is expanding the channels of communications in order to handle the higher level of information flow required by a more demassified society. The theory of demassification is one of the key reasons for the information explosion; it helps to explain why this industry has suddenly become as important as it has.

That seems to be a fairly key question. You automate and yet try to create a more individualistic, more democratic approach to working.

Give the individual more discretion, more varied job functions, a greater sense of control over the situation, and you get more output than you will if you simply assume he is a sort of unnecessary interference in the system.

What happens to those clerical jobs that remain? Somebody has to do them; even the machines that facilitate these tasks have to be operated by someone.

People should not be expected to spend their full time doing the same thing. If a person is going to spend a considerable amount of time typing routine stuff, he ought to have some other function in the company as well. It would be a terrific motivator to get away from that machine. The machines themselves can be designed to be more comfortable — less cold, metallic, frosty. I think they ought to be made out of terry cloth.

Will the unions pick up office automation as an issue here as they have in Europe?

I feel certain they will. They have already. If I were on management's side and the union were complaining and making noises, I'd probably be uncomfortable.

But if I look at it from the outside, I have to say some pressure is good. Otherwise, who is going to insist that we pay adequate attention to health standards and job decency?

Without some external pressure on the system, a tendency to cut corners will always exist, and the outfit that cuts the most corners is going to have the cheapest price. Technically, that would be a positive feedback cycle going in the wrong direction. Unions create a countervailing force. Even if it's sometimes misinformed and even if it's strident — which I think it is — nevertheless, it's good for it to be there. If there were some other institutions in society to do it, fine. But in fact, there really aren't.

Is the job of secretary dead or dying, as you pointed out in *The Third Wave*?

Certain functions are repetitive and probably inescapable, so I don't look for the total elimination of routine. But I see routine as being less and less important.

Nobody likes to spend half his life typing and retyping, particularly retyping. To the degree that we simplify that process, that's a plus. To the degree that the secretary is invited to think, that's all to the good. The move toward the assignment of routine tasks to machines has one of two results. Either no tasks remain for the workers and unemployment is therefore a big problem. Or there are tasks, and they tend to be more discretionary, more creative and so on. No machine can do what my secretary does now — exercise judgment.

It's clear we are going in a basically good direction. But you have to be careful not to dehumanize the system, because the really valuable stuff comes from people.

How will executives respond to the OA push?

It depends on how much time is involved in learning to use the system. Despite all the beautiful design, systems today are still very primitive, and the cost of learning them is still very high. As a result, a natural resistance exists on the part of executives who regard their time as extremely valuable. Another problem is that if you learn a complex system, but use it only infrequently, you will unlearn it very quickly.

Executives are oral, not print-oriented types. They are more comfortable with oral communication than with written. When we can begin talking to the machines fluently, they'll be very happy to use them.

What will happen as young managers versed in computer technology come into executive positions?

Again, an engineering notion is behind a lot of this stuff that says you can turn people on and they're going to be highly productive 100% of the time. That's nonsense.

We have to break through the idea that an executive is a person who drives 33 miles a day to a central location where hundreds or thousands of people work in cubicles, and, unless you go there, nothing gets done. That's an absurdity. The office of the future is going to be smaller and decentralized — it's not going to look like that. Typing pools or factory-style organization will gradually break down when we discover more productivity can be achieved through other forms of motivation and organization.

The electronic cottage theory — working at home or at remote work sites — seems to suggest a rethinking not just of technical aspects of the office but of the whole concept of work.

Let's take the reconceptualizing of a job and work. Why do I think millions of people will be working at home? Because it is economically unproductive the other way.

The country is frantically trying to increase "productivity," the buzzword of the year.

In the drive to increase productivity, what is the single most antiproductive thing you can do? Two approaches are common: you either squeeze the worker or you introduce smarter machines. All the gains that can be made from OA and from squeezing the work force are absolutely small potatoes compared with potential gains for the economy in shifting a significant number of jobs into the home.

Why? Because if the price of transportation goes up, the worker has to ask for a wage increase in order to get to the office. A transportation subsidy is therefore built into the wage package. In addition, to sustain the commuting system, the company has to provide parking lots, cafeterias and locker rooms, not to mention the public infrastructure — taxes for things like roads, highways and police.

When you begin to aggregate the cost for all that and then recalculate productivity figures, you suddenly notice the enormous drag on the economy or on any individual company. What could you save by giving the worker a machine, allowing him to go home and work at the hours when he is most productive in the style in which he is most comfortable? Compared with any technological work changes we've talked about, the potential productivity gains are just enormous. We can pick up 1% here or 1% there, but doing this, you can pick up 20%.

Many organizations are trying work at home on a very small scale. What must happen for this to become a large-scale phenomenon?

First, it may not come through big companies. Maybe we're looking in the wrong place. Perhaps the first development will be through very small enterprises and very innovative and entrepreneurial people doing their own thing.

I see people going to a company and saying, "You now have X number of people in the office handling invoices. Contract that out to us. We'll stay at home and get it done for you. Pay us a flat amount and we'll be your invoice department. We'll be a separate company and we can do it cheaper than you're doing it." In fact, I'm certain they could do it cheaper than it's now being done. At that point, you get a mesh between the little entrepreneurs and the larger organizations, and it begins to be profitable for both sides. I see it spreading. Almost gravity-like forces are moving in that direction.

However, I have to disabuse two cliches that are attributed to me. The first is that everybody is going to work at home. I don't think that's true. The second is the idea that people are going to work only at home. I don't believe that either.

The notion of social isolation is the primary argument raised against work at home. This is an historical absurdity. It presupposes that people were lonely before we had factories to bring them together. Emotional bonds, close social contact and the opposite of social isolation were present before we got to the alienating factory.

But people do get much of their socialization from their jobs and they would lose that.

They do. They might lose some of that, but they would pick up a considerable degree through closer contact with the family unit, more time spent with the kids, in the community and with their neighbors.

The way the system works now, you go to work and the suburb becomes a graveyard of loneliness. You come back. You've fought the traffic and it's now nine and a half, 10 hours later. You're dead tired. You take a six-pack and watch some idiot program on television — you don't have the energy to do anything else.

Turn that around. Now you work at home all day. You get up at 9:30 or 10. You feel productive. You put in a day's work, and now it's evening — boy, have you got cabin fever. You want out and so you go out. You go to a restaurant, a theater, a community political organization. You get involved in the community in a way you don't when you've spent your days away.

We have to break through the idea that an executive is a person who drives 33 miles a day to a central location where hundreds or thousands of people work in cubicles and, unless you go there, nothing gets done.

But it's not for everybody. Some marriages would crack instantly under the strain of togetherness. Others would be cemented together.

Have you seen examples of techno-rebels — as you called them in *The Third Wave* — fighting office automation?

There is a lot of resistance and a lot of resentment. The questions of physical security of machines and data security are going to be aggravated by the attempt to turn the office into a factory. Factories are hellish places. The objective of this technology should be to eliminate that environment entirely.

The most advanced form of production may in fact not be mass production but customized production based on high technology. It may involve "headcraft" rather than handcraft.

I have no idea how legitimate the claims are about CRT health hazards. But if companies don't want to find themselves involved in a lot of lawsuits in five or 10 years, they should be thinking about these issues now.

The response to technology in the office, though, has been very positive.

They love the machines, surely. Most people who use word processors don't want to go back to typewriters. I understand that. I spent half of my adult life retyping dirty manuscripts. Using a word processor is liberating. But at the same time, I don't have to sit there and use it eight hours a day, five days a week. I would urge the executive to try that routine one week a year and see how long he could take it.

I have no idea how legitimate some of the claims are about the health hazards associated with the CRTs. I'm skeptical. But it is not an issue to be shrugged aside. If companies don't want to find themselves involved in a lot of lawsuits in five or 10 years, they should be thinking about these issues now.

Isn't that a basic obstacle for something like OA? Things get bad and our society says, "Let's go back to the good old days."

We're not the only society that does that, but we are good at it. It's one of the big differences between ourselves and the Japanese.

I'm extremely skeptical when all these experts tell us to adopt Japanese management models. Personally, I challenge the assumption that Japanese productivity is higher than ours. It depends on which narrow sector of the economy you look at. The Japanese are very good at certain things, but their secret weapon is not technology or management — it's being future focused. That derives from their being an island and being extremely vulnerable, whereas our complacency comes from our being a continent and less vulnerable.

People tell us Japan is number one and we ought to do central planning or strategic planning along the Japanese model, or that their education system is better than ours. These people are really smoking opium — they're trying to sell us a used Toyota. Because right now the Japanese are precisely reevaluating all of their systems.

If you talk to the leaders of Japan — and I've talked to prime ministers, top corporate executives, members of the Diet and journalists — they all say we've got to change the present system. It doesn't produce creative kids. It's made for standardization. It's made to turn out obedient factory workers, and that's not what we're going to need.

So we in the States are being told to model our selves on increasingly obsolete systems. There really is a big difference going from Japan, where every day's newspapers are filled with the future and the bookstores are lined with books about the future, to this country, where you really have to fight to get the future into the public discussion.

Since we're entering the information age and most people will be involved in producing information or services, who will produce the products necessary for the quality of life we are used to?

We will have auto plants and steel plants, but they'll be manned by very few people. The manufacturing work force will be down to the size of the agricultural work force, according to some estimates.

There will be an enormous growth in service occupations. We haven't even begun to invent all the services that are saleable in this society. Low tech is going to have to become high tech.

Describe the office of the year 2000.

I think we're going to get away from the idea that machines are made of metal.

I was joking earlier when I said that machines could be made of terry cloth, but it's not such a crazy thing to begin looking at the implications of biotechnology for the computer industry.

Eventually, I see some kind of fusion between computer technology and genetic technology in a more general sense. When those two things hit, there will be an enormous leap forward in technological possibilities.

We're obviously blue-skying now — but why does a computer have to have a keyboard? If you're going to talk to it, it doesn't need a keyboard. I can imagine a computer that looks like a piece of cellophane and sits on the wall. If it has the right internal processing capabilities, it really doesn't matter what its shape is. .

Our homes are going to change in structure. I think our conception of family is also going to change. Those things are closely connected with work and with production. If you think of society as a very complex open system with a lot of chance operating in it and a lot of surrealism mixed in, it nevertheless has certain structural characteristics that interact.

If you ask me what the office is going to look like, I have to ask some things in turn.

What's the military going to look like? What's the home going to look like? What's our definition of work going to be?

And only then can I begin to imagine how an office might be reshaped. OA

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The Best Laid Plans...

OA planning should take employees' needs into consideration. Unfortunately, that isn't always the case.

By William S. Brown

Judging from the system carcasses littered about the office automation landscape, we in DP do not seem to have a valid model of how people use information or how the use of information changes people. Personal computing, text processing, decision support systems, host center data bases or any of the public data networks can change the behavior and information-using patterns of their users. Information systems and users develop together; we can only hope each improves the other.

If this symbiotic view of information systems development is correct, how does one go about specifying a system? Information systems developers must answer four fundamental questions:

- Functions: What does the user want to do?
- Capacities: How should the system be sized, in terms of storage, memory, input, printing and communications?
- Topology: Where should the system perform each function? Which functions should be centralized, which distributed?
- User characteristics: What are the ergonomic, training, administrative, cultural and organizational characteristics?

Although all the questions are important and highly interrelated, the key question is the first: What does the user want to do? Answers to this question delimit the answers to the other three. The user must decide if he wants personal computing; personal copying; word processing;

optical scanning; electronic mail; electronic filing; voice store-and-forward capabilities; photocomposition; business graphics; access to host center computing, such as large data bases; public data networks; interactive financial modeling or legal search services. Confronted with a pressing mix of problems, the user often seizes on the first solution that seems to solve a significant portion of those problems. As a result, the first venture into OA for many organizations has been WP. Solutions for the "text processing problems" are abundant, easy to implement and relatively cheap. Never mind that the solutions sometimes turn out to be wrong — and costly.

Users are often misled by the seemingly low costs of systems. Hardware costs are declining dramatically. Software costs are reasonable for most off-the-shelf software. These relatively low costs, however, tend to mask the true value of the system to its users.

A personal computer may cost $3,500, the printer $500 and the spreadsheet software and data base management system another $1,000. The value the user adds to the system, by developing personal programs and loading the initial collection of data, may cost his organization another $15,000 to $30,000 in burdened staff time. Replacing the data or programs could cost even more in lost opportunity costs. This is the value-added cost of the system — the value added to the system by its successful use. It's this cost that walks out the door when the developer of a successful but complex and unmaintainable system leaves an organization.

We enjoy an embarrassment of riches, in this, the New Information Age. Many organizations are rushing to support their professional staff with personal workstations, without much thought about how these devices will be integrated into the other information systems already in place or planned. Other organizations, recognizing that pitfalls do exist, turn for help to their DP departments, which trot out the classic systems development methodology in fond remembrance of the "good ol' days."

The classic model for information systems development depends on a structure that has great rational appeal but is rarely in tune with reality. One version, which is always defined in terms of neat predictable phases, has the business analyst sit down with the user to perform a feasibility study and then a functional requirements definition. The analyst tries to find out what the user wants to do. Implementation alternatives are evaluated, and the next phase is turned over to the systems designer, who lays out the general and detailed design specifications. These in turn become blueprints for the system implementors, usually a team of programmers with a varying mix of skills and orientations. At this point, the business analyst and user get involved again, readying the system and its documentation for user tests and installation.

The classic model has great appeal for management because it believes the results of each phase are measurable and, if the project is late or over budget, corrective actions can be taken before calamity strikes. The classic model probably does have some application, particularly for large multi-year systems development projects. Where it clearly does not apply is in the implementation of OA information systems. What users want to do with OA systems tends to change dramatically, particularly during the first few years of the system's life cycle.

A more useful model for the development of OA systems might be drawn from synecology, the branch of ecology that deals with the structure, development and distribution of ecological communities. If man is seen as a tool-using creature, with information as his principle tool, then the study of interrelationships between man and information could be labeled the ecology of information.

What users want to do with OA systems tends to change dramatically, particularly during the first few years of the system's life cycle.

Communities may vary in size from a handful of individuals to several hundred. Constituency of the communities may vary, and individuals may belong to several information-using communities, each with its own set of information systems, at the same time. Some information systems serving these communities will be automated; many important ones will not. The ecological model for information systems development is valuable for two reasons: It is a humanistic view, with an emphasis on the tool user rather than on the tool (the technology). Second, it compels the system developer to think about both the individual and groups of individuals, whose information requirements and patterns of usage change constantly.

One of the first principles can be stated as follows:

• Information users and systems are both symbiotic and synergistic: symbiotic in that an almost organic interdependency exists between user and system; synergistic, because the sum of the combined effects is greater than the total of the individual contributions. The successful use of an information system changes the user, sometimes profoundly. The information system must be capable of accommodating an evolving user or find itself relegated to the junkyard.

The human need to grow, to learn and to change may be one of the most deep-rooted human needs. From early in our existence, we form patterns in our minds of how the world works. If those patterns remain static and fixed, we stagnate. The force of technology is driven by this need to grow. Because the new OA technologies can be so supportive of this basic human need, this brings us to the second principle:

• OA has vast potential for beneficial change. Not only can it change us as individuals, but also it can change the design of work and how work is structured, how organizations are developed and how, eventually, society itself is organized. Ensuring that such changes are indeed beneficial poses some interesting challenges. Not only management but also employees and employee representatives (such as unions) must be open to the change.

If you are charged with developing an OA strategy or system for your organization, you may wonder what real-world implications will result from these theories. A complete catalog of possible implications will not be attempted here, but it is useful to begin such a process. OA strategies and systems can be developed by following these general suggestions.

• Form an OA team within the organization. Include potential users, information system professionals, administrators, secretarial and clerical support, records management and human resource people. A user representative should lead the team and user requirements should govern. All too often, technical issues cloud the proceedings and force unrealistic constraints. If union representatives are enlightened, you may want to include them on the OA team. A well-qualified OA consultant can be very helpful at this point. Check consultants' experience, training, orientation and references carefully.

The most important step is to properly scope the OA team's efforts. Management and users must understand that the team plans to review a mix of technologies and systems, not just WP or records processing or personal computing. If they're not anticipated and dealt with at the beginning, turf problems can lead to a premature death for OA efforts.

• Develop an overall OA architecture. At this point, it does not need to be much more than a shopping list of possible OA projects. Although not necessarily rigorous or exhaustive, it should give a fairly detailed description of

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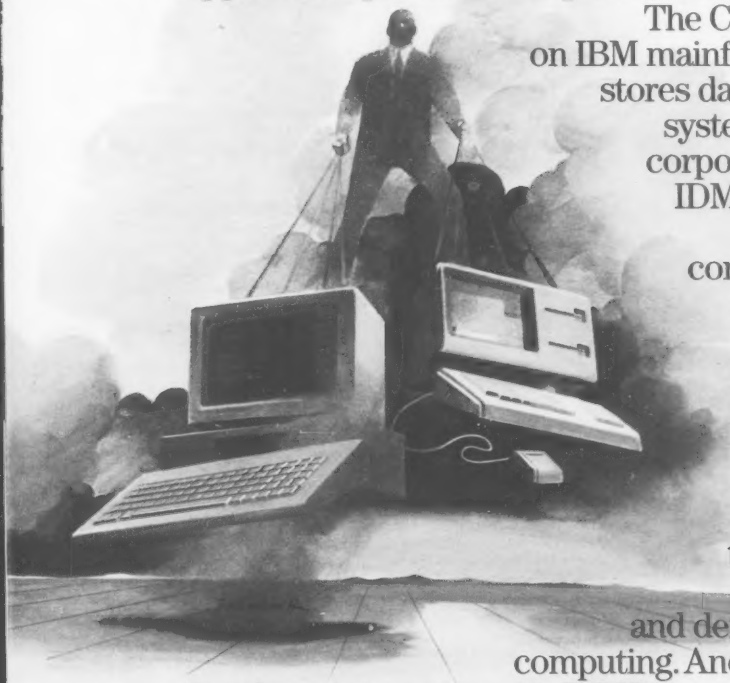

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the organization's goals, objectives and administration. Some attention must be paid to existing and planned information systems. The most important part will be the selection of the first OA project. Two or three possibilities, along with descriptions of the pros, cons, relative costs and impact on the organization, should be presented to the most senior management for its recommendations. Each possibility should be described in terms of function, capacities, topology and user characteristics.

• Start with the first OA project. It should be small but visible and relevant. Link the OA project's objectives to organizational objectives. Avoid applications with a mix of technologies, such as WP and electronic mail. If this step is done with care, it should be possible to add functions later with relative ease. Also avoid first applications that require profound changes in the policies, procedures or organization itself.

• Shop for vendors, not for specific system solutions. Choose your primary vendor with the attitude that your vendor's systems will be around for a while and the organization's very existence will depend on them — this is no time to be penny-wise and pound-foolish. Consider the acquisition cost, but balance that against the value-added cost, as discussed above. The primary vendor should be chosen on its ability to offer as wide a spectrum of integrated systems as possible, along with its ability to offer a specific solution congenial with your first OA project.

Be skeptical of vendor claims about the degree of integration of their systems. Insist on visiting other organizations where these integrated systems are in use. Take your OA team with you and gather notes about implementation details, such as standards, controls and training. As part of your evaluation of vendors, consider abilities and past performance when it comes to training, on-site consulting, research direction and financial stability. Later, as your OA information systems mature, you can solicit other vendors to fill in the gaps of your primary vendor's product and service offerings.

• Begin immediately to develop the necessary controls, procedures, standards, training resources and other forms of administrative support that may not seem so important now — they are. If you did your homework during your visits to other organizations, you should have a decent set of material with which to begin. A good vendor should be able to assist you with this, but only if you ask.

• As you achieve successes with OA implementations and your information systems mature, it will become more apparent that significant opportunities exist to capitalize further on this wealth of technologies, but only if work is redesigned or the basic structure of the organization itself is altered. Major opportunities exist to make work more humane and people more productive. One impediment to OA has been the realization that, if it is to be used really well, profound changes will be needed within the organization or the way work is done.

Management afflicted with a shop-floor attitude toward OA, who see it principally as a chance to get rid of half the typing pool, would do well to try and adopt a more holistic view of the work place. Although they may not subscribe to the ecological thesis articulated elsewhere, management must see that profound changes in work attitudes and habits are possible and can be beneficial, not only to employees, but to the bottom line as well.

Changes in work redesign or organizational restructuring should not be attempted single-handedly, however. Competent consultants should be employed. At this point, reliance on your OA vendor for support can be disastrous. Most major vendors themselves must go outside the organization when changes of this sort are contemplated.

• Always keep in mind that you will probably never get a solid answer to the key question: What does the user want to do? What you will get is an answer that tells you what the user wants to do first or next. As the user gains experience with the system and his knowledge grows, he will become more demanding. It may be small comfort, but user requests for improvements and changes to the system often are not signs of dissatisfaction, but rather of acceptance and reliance.

• Remember two things: There are no guarantees, and there is no such thing as a free lunch. Enter into the process with as open and inquiring a mind as you can muster. Plan on working overtime. Work with your fellow team-members and value their contributions. Give everyone a stake in the process. Be fair and forthright with vendors. And good luck! OA

Brown is a consultant in Santa Fe, N.M.

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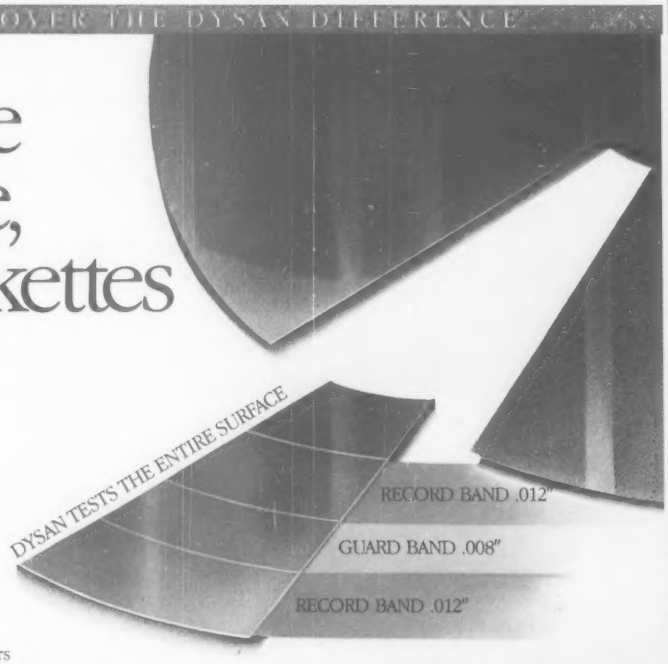

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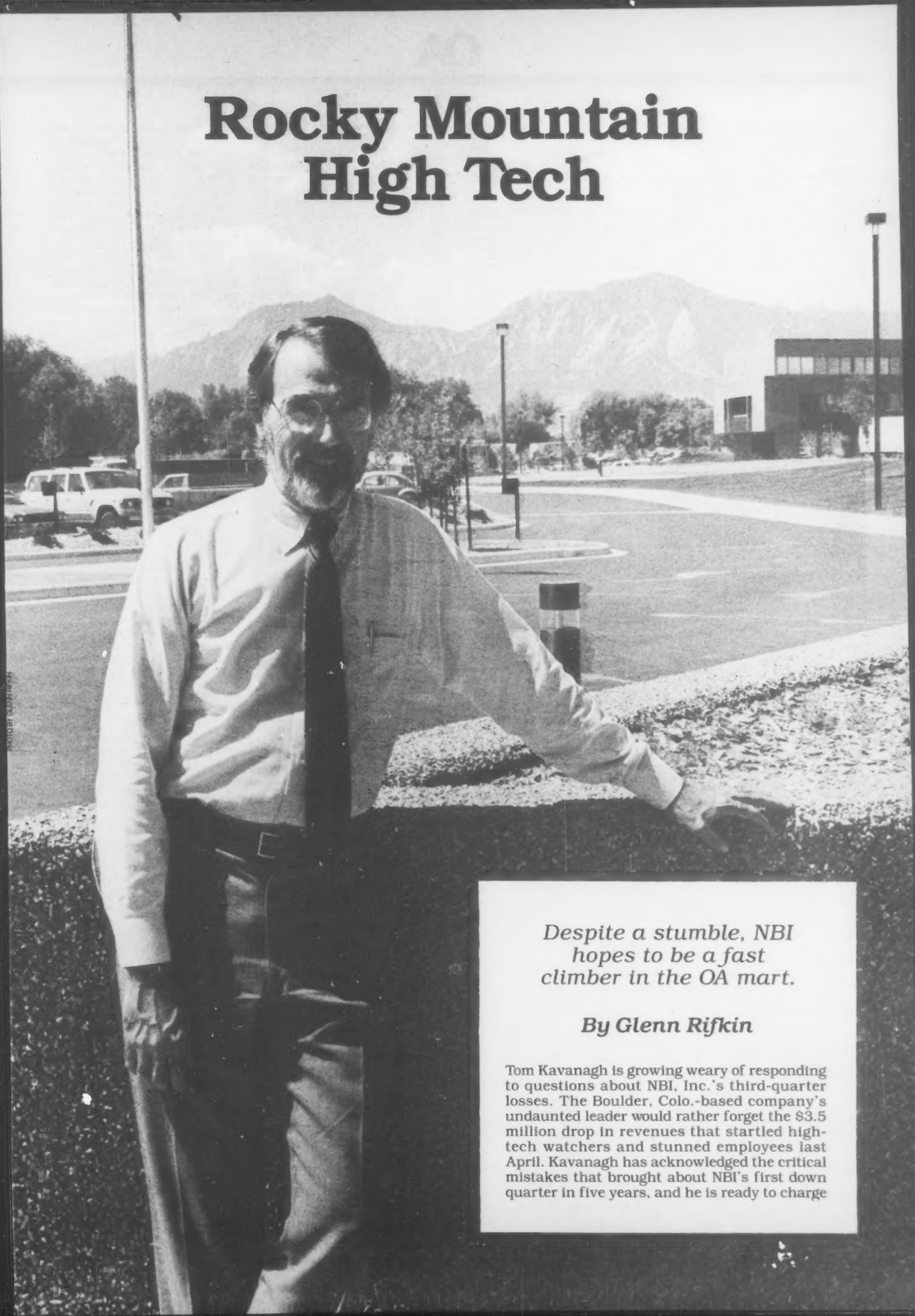

Despite a stumble, NBI hopes to be a fast climber in the OA mart.

By Glenn Rifkin

Tom Kavanagh is growing weary of responding to questions about NBI, Inc.'s third-quarter losses. The Boulder, Colo.-based company's undaunted leader would rather forget the $3.5 million drop in revenues that startled high-tech watchers and stunned employees last April. Kavanagh has acknowledged the critical mistakes that brought about NBI's first down quarter in five years, and he is ready to charge

toward what he feels is the inevitable recovery.

To Kavanagh, the loss is merely a momentary stumble. He has set his sights on making NBI "the major independent supplier of high-performance office information systems in the world"; buoyed by the April introduction of an entire new line of office systems products, Kavanagh feels that NBI is on the way. "We mean to be number one. That's our corporate goal, and we expect to do just that."

Such inspirational declarations smack of corporate rhetoric. However, if any of the small independent office systems firms have a shot at competing head-on with IBM, Digital Equipment Corp., Wang Laboratories, Inc. and the other top vendors in the OA arena, it may just be NBI.

The transition, however, will not be easy. With a solid reputation as a WP vendor, NBI is now using its knowledge of the office environment in its drive to become a major OA vendor. The expansion into the office systems market has already struck NBI a blow — the third-quarter loss and other internal problems. Whether the move will be a success remains to be seen. Whatever the outcome, this coming year will be a critical one for NBI.

According to Kavanagh, the third-quarter loss was a result of a "blow out" second quarter that "sucked a lot of business into that quarter" and a change in the sales forces' compensation plan. Another major factor in the loss was that customers reportedly got wind of impending product announcements and decided to mark time until they saw what the company had in mind. Kavanagh said company officials were well aware of the problems and forewarned investors and financial analysts of the impending bad quarter. Despite the warnings, the loss hit home for the company's 1,800 employees who have always felt "an incredible amount of intensity and pride here," according to Paul Harris, NBI's manager of corporate communications.

The third-quarter loss of $3.5 million was from revenues of $23 million, compared with net income of $2.7 million on revenues of $25.1 million for the third quarter of 1982. As a result, stock that earlier sold for 47-5/8 dropped to 30; it has risen slightly since then. (Fourth-quarter earnings were unavailable at press time.)

If anything, the loss has made NBI that much more determined to succeed and the financial community still looks fairly favorably on the company. A report by Goldman Sachs investment house stated, "We are impressed by [NBI's] new products and believe they will be well received in the marketplace. We thus view problems seen in NBI's third quarter as transitory."

Conditions that caused that quarter, the still-confident Kavanagh said, don't exist anymore and NBI signed more major account business in the month of June than in any month in the company's history.

The new products contain several additions to the company's Oasys product line as well as a family of OA products, including:

- System One, the Integrated Work Station (IWS) and the Integrated System Server (ISS).
- The Oasys 4000 — an ergonomically packaged, lower priced version of the Oasys 3000 line of cluster and stand-alone WP workstations. The Oasys 3000, considered an older system, will be sold at a reduced price in order to clear out inventories.
- The Oasys 2000 — An Intel Corp. 186-based personal computing workstation, MS/DOS with 256K bytes of memory designed to function as a cluster workstation with the Oasys 64 system.
- NBI Net — NBI's version of Ethernet.

In January, NBI announced a 3270 (Systems Network Architecture/Synchronous Data Link Control) communications product for its Oasys 64 series of shared resource products. Although the new products clearly indicate a change in emphasis, Kavanagh believes the moves are simply the next step in a natural progression for NBI.

Except for the Oasys 4000, which was shipped on the day it was announced, the rest of NBI's new products have yet to hit the market. It is too early to speculate on how successful the products will be, according to Michael Hammer, of Hammer & Co., Inc., a Cambridge, Mass., consulting firm. "They are, however, taking important steps that show they have the correct view of the world. There's not much profitability in being strictly a word processing vendor anymore. They probably have the best shot of all the word processing companies to be a successful office systems manufacturer."

For NBI, the move toward OA follows a hugely successful advance into the WP marketplace. In the eight years since it opened its

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doors, NBI has climbed to fifth place in that marketplace, behind IBM, Wang, Lanier Business Products, Inc. and DEC, according to a report by the International Data Corp. (IDC). Having grown at an annual rate of more than 100% since 1979 with revenues reaching $100 million for fiscal 1982, NBI now has 34 direct branches, six district offices and 54 international locations in 17 countries.

Contrary to legend, NBI does not stand for Nothing But Initials. Company officials are content to let the popular myth continue. In actuality, NBI was born in 1975 when Kavanagh hooked up with Howard "Binx" Selby, who was trying to market a small business computer he had invented two years earlier.

Before joining Selby, Kavanagh, with a group of three others, had left IBM in 1969 to found Storage Technology Corp., the Boulder-based computer memory device outfit. He left STC in search of other opportunities, and decided to team up with Selby in the new growth area of word processing. "We thought the initials NBI were clearly different from others in the WP field. It doesn't stand for anything. My feeling is that a company name is only what you make it," Kavanagh said.

'The industry is in an important transition, and it will be hard and expensive. If NBI wants to play in the big leagues, it will cost them.'

Based in Boulder, a sprawling community nestled in the foothills of the Rocky Mountains, NBI attracted a group of talented and motivated engineers who were turned off by the fast-paced rat race of the Silicon Valley. NBI offered them an opportunity to work in what Kavanagh called a "wholesome" atmosphere.

Solid work environment aside, NBI is facing its sternest test by entering the OA field. "The easy days are over. The days when a WP company had very high profit margins are gone. The industry is in an important transition and it will be a hard and expensive transition. If NBI wants to play in the big leagues, it will cost them," Hammer said.

According to the financial analysts, NBI certainly has the tools to join the battle. Paine Webber Mitchell Hutchins, Inc. pointed out that "the announced new products position NBI squarely in the middle of the office automation market, with its word processing niche enhanced and secure, but now only one piece of a much greater opportunity."

Building on a base of clustered products, including the Oasys 3000 and the Oasys 64, NBI has doubled its product line with the System One announcements. Although the company is touting all of the new products as integral parts of a whole, the Integrated Work Station (IWS) is the "flagship" product, according to John Melanson, director of advanced engineering development. After serving the secretary/clerical sector of the office since its inception, NBI is positioning the IWS to capture the "superprofessional" — the knowledge worker.

The IWS resembles the Apple Computer, Inc. Lisa and Xerox Corp. Star in that it has icons, multiple windows and an optional mouse. Along with a Unix operating system, its tools include data base management, document development and word processing, business graphics, spreadsheet, project scheduling, calendaring, and personal computing. Based on a 68010 microprocessor, the IWS is reportedly much faster than a Lisa and can run four seperate operations simultaneously.

NBI claims the IWS goes beyond the Lisa and Star. However, IWS does carry a $12,000 price tag, and that figure has brought expected response from industry analysts.

Amy Wohl, president of Advanced Office Concepts, a Bala Cynwyd, Pa., consulting firm, noted that the IWS looks the way Lisa should have looked. "They may say it doesn't compare to Lisa, but they're wrong. It will be perceived by customers that way. It is also too expensive to have any impact at all. If they could have sold it for $6,000 or $7,000, they would have something."

Kavanagh doesn't agree. He called the IWS "a VAX on a desk" — a tool for a professional who spends a large portion of his working hours using computer power. In Kavanagh's opinion, many people will be willing to pay the price because of the support they will receive from NBI in integrating that product into their work environment.

Industry analysts agree NBI is

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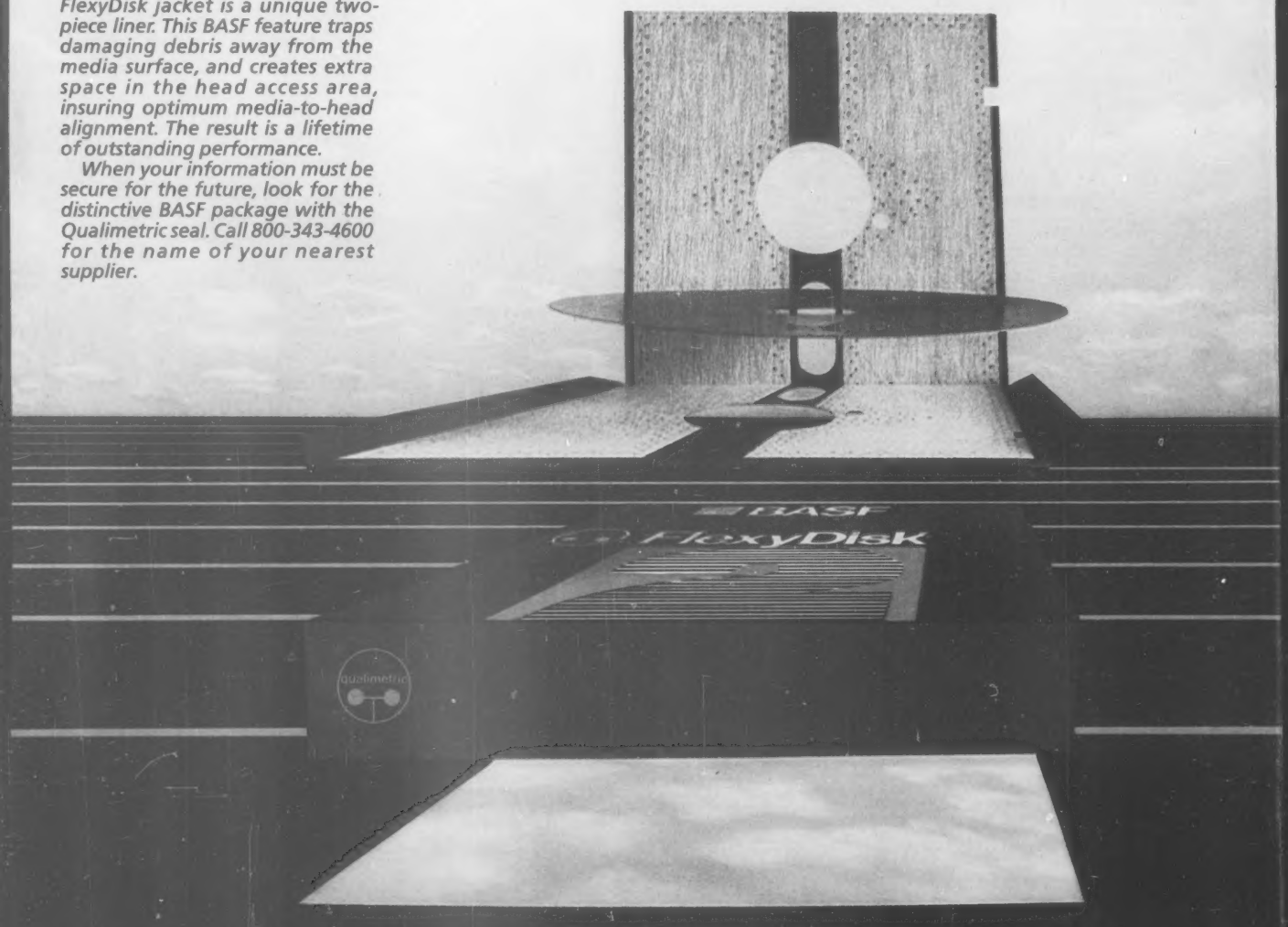

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on the right track by operating in an IBM environment. Kavanagh admitted it is pointless to try to fight the IBM Personal Computer since it has become the de facto standard in the office. Designed to run exclusively in the Oasys 64 multiterminal environment, the Oasys 2000 indicates NBI plans to avoid the stand-alone personal computer market.

Though their WP customer list is impressive — including General Motors, AT&T, U.S. Steel, Allstate Insurance, Shell Oil, Gulf Oil and virtually every government agency — NBI may face a sterner test getting the large organizations to invest in their OA systems. According to Wohl, NBI has been most successful in "second- and third-tier-type firms," rather than large organizations. Companies in those size ranges will take longer to invest in entire OA systems. This can work in NBI's favor because it gives them more time to organize and refine their product line. "The biggest thing going against NBI is they are not a computer vendor and everyone knows it," Wohl said.

NBI has reportedly been unwilling to tell customers about future directions and that is said to have hurt them with organizations looking for long-range planning. The new product announcements will alleviate that problem for the near future, according to Wohl. The mandate now will be to gear up for producing and shipping the vast new line.

"We're not a backlog-oriented business," Kavanagh stated. "Typically, orders we generate in the quarter, we ship in that quarter. It doesn't do any good to take orders if you can't ship them; if the customer has to wait, he'll go someplace else." Until now, NBI has been high on user satisfaction lists. NBI was ranked first among the top 20 office system vendors in a recent service and support user survey done by the "Office Products Analyst," a newsletter by MSRA, Inc., a New York consulting firm. In order to continue this type of service and support, NBI will have to face the task of retraining both the internal organization and the sales force to complement the new product line.

NBI feels it can meet this challenge because it has a buffer. It is a cash-rich, debtless, independent organization that owns its entire facility base, including buildings and a vast amount of prime Boulder real estate.

As in any expanding organization, however, NBI has had some growing pains. Insiders feel that the company is slowly becoming what it had been set up to avoid, a large and impersonal business. One employee indicated that some of the original NBIers miss "the good old days," even though those days were just five years ago. As the company expands, employees can no longer run into Kavanagh's office for advice; with more than 1,800 employees, it is impossible to feel the closeness of a smaller group.

Another problem NBI has to deal with is a lack of visibility, particularly in the East. Making the leap into the OA marketplace is going to require a greater awareness among the general public. Kavanagh believes NBI is already visible to the people it is seeking to attract. In his view, the company owes its success to its ability to focus, since the early days, on what it wanted to accomplish — on having an overall strategy that ties together. This focus, bringing more pressure to bear on a point than the competitors, has made NBI profitable.

"The underlying thread is that we will be a profitable company, and profits are the scorecards of winners," he said. OA

Rifkin is a staff writer for Computerworld OA.

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New Support for The End User

Remote computing service firms aren't just for mainframes — now they're offering support to microcomputer users, too.

By William B. Walton

The migration of office automation activities toward multifunctional decision support stations has received much of its impetus from developments in two related areas:

- The proliferation of microcomputers in the corporate environment. Not only has hardware appeared in many managers' offices, the level of computing consciousness among middle management has also risen.
- The broad acceptance of the information center concept. This concept has emphasized providing necessary training and software tools to let end users in a mainframe environment satisfy their ad hoc computing needs independently.

DP and OA technologies are converging on the concept of personal computing. This environment supports the individual's activities and thought processes through software that allows user involvement in an interactive and often iterative solution process. Important aspects of the personal computing environment include user training and access to data — whether that data is a letter, a laboratory test result or a divisional sales forecast. Although personal computing can be implemented without personal computers, most management support systems are an integrated blend of micro and mainframe capabilities.

The growth of microcomputing and the development of in-house information centers has profoundly affected the DP kingdom of the remote computing service (RCS) or time-sharing vendor. Until recently, some RCS vendors primarily sold resource availability to end-user and DP departments. However, a review of the market indicates that, in reaction to the current computing environment, most RCS vendors now offer a more diverse variety of user-oriented products and services. Because of their increasing interest in end-user (personal) computing, RCS vendors now offer many products and services useful to organizations currently developing or implementing an office systems strategy. These services include networks, applications software, microcomputer products and interfaces and external data bases. These areas will be discussed separately in the rest of this article.

One major OA objective is to make the job of communication easier within an organization — communication between two managers in the same building or between two computers on opposite coasts. The OA communications puzzle has many pieces; fitting them together successfully will require sophisticated data networks. These networks must combine geographical coverage with the ability to connect equipment from multiple suppliers using different protocols. Network capabilities are an integral component of most RCS vendors' time-sharing offerings; less commonly, they are a separate value-added service.

Networking services will be increasingly important as organizations strive to solve compatibility problems created by the convergence of DP and office systems. These services will also be needed to solve problems that have resulted from the independent equipment acquisition paths different departments or divisions have followed in recent years.

The emerging demand for data communications has led several vendors to offer their networks as separate value-added services. GTE's Telenet and Tymshare, Inc.'s Tymnet are examples of well-established value-added packet-switching network services that organizations can lease for data communications and distributed processing.

IBM's Information Network is a relatively new entrant into the time-sharing and networking market. In an agreement announced recently, independent insurance companies and agents will use the Information Network's processing and communications capabilities to transmit transactions and other data among numerous office locations across the country. For this large-scale application, the Information Network is providing not only data communications, but also protocol conversion capabilities that will connect equipment from nearly 70 different vendors — equipment previously considered incompatible.

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(BCS) recently combined its DP facilities with the parent company's private telecommunications network to form the Information Network Services Group. This new group has reportedly evaluated the OA market and will be incorporating office functions into the network service.

Other vendors that have entered this business include ADP Network Services, General Electric Information Services Co. (Geisco) and United Information Services, Inc. (UIS). Because of the excellent business opportunities offered in the telecommunications area, other vendors with strong networking capabilities will probably soon enter the value-added networking market. Of course, American Bell, Inc.'s Net 1000 service should be a significant force in this area.

Several vendors offer electronic mail services (for example, ADP's Automail, Tymshare's Ontyme, UIS's Unimail) as an effective way to utilize their network capabilities. Many of these systems are available for in-house installation, which allows users and OA administrators to use and evaluate an electronic mail system on a time-sharing basis prior to buying software. Previous articles ["Phone Home," CW OA, Dec. 1] have covered these services in detail, so I will not describe them further here.

DP and office systems are both heading toward the area of end-user computing, and there they will ultimately intersect. However, end-user computing requires a collection of user-oriented software that can perform office system functions as well as simplify the development and implementation of data base management, financial modeling, statistics and graphics applications. Many in-house DP groups are unable to provide this variety of software. Those that can provide the software frequently lack the staff necessary to provide the level of support and training end users need to independently satisfy ad hoc information needs.

RCS vendors are recognizing the new set of opportunities created by the trend toward personal computing. As a result, they are offering more user-oriented software, such as relational data base management systems and fourth-generation languages as well as more application support to meet end-user needs.

IBM, for example, offers the Professional Office System (Profs) product on the Information Network. Profs is an office systems product that allows the user to send and receive electronic mail; maintain calendars; and create, edit, file and retrieve documents. Completing Profs on the Information Network is IBM's Application System, a user-oriented data base management system and application development tool that integrates a range of DP capabilities into one environment. These capabilities include data management, financial modeling, statistical analysis, WP and graphics.

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Training and support are critical areas in the implementation of an office system or personal computing strategy. As mentioned above, many in-house time-sharing groups are unable to provide the appropriate level of service in these areas. This situation creates a void that several RCS vendors are trying to fill. National CSS, Inc., for example, offers a strong training program to accompany its time-sharing products, particularly Nomad2. This emphasis on training carries over to the Nomad2 Information Center product, which is available for in-house licensing. Consultation on the design and implementation of applications, as well as ongoing advice and support, are included. Vendors such as these have learned that training and support are important services, and many end users are willing to go to an outside company for them.

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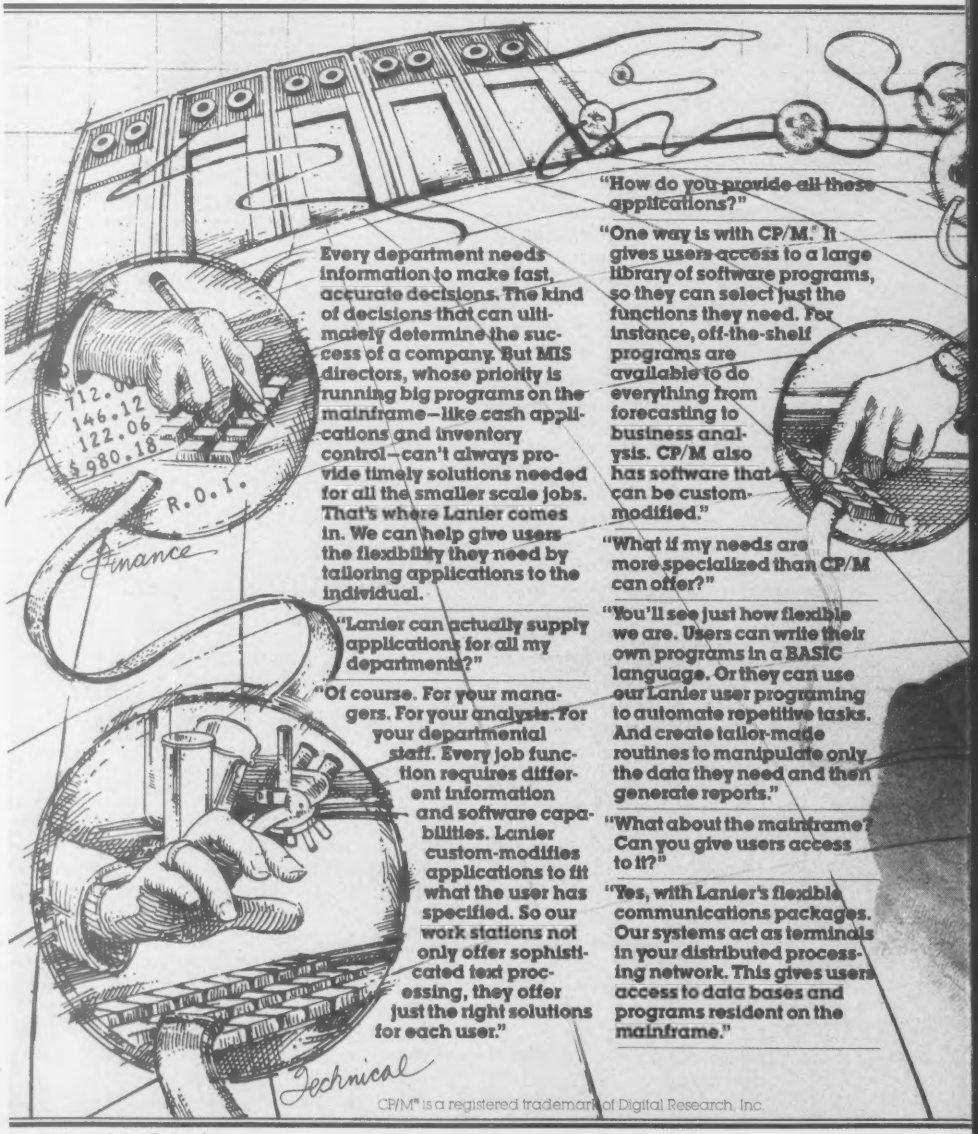

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microcomputer will be the primary vehicle for delivering OA to the manager's office. Programs like Visicorp's Visicalc have helped clear a space for the micro on the manager's desk. When the usefulness of the micro has been proven further, applications for it will be sought. These additional activities will logically include connection to mainframe systems as well as personal data base, electronic mail, calendar scheduling and so on.

Although micros will erode some areas of the RCS vendor's domain, many vendors see micros complementing the mainframe products and services they already provide. These vendors are approaching micros as an opportunity to be pursued. Their microcomputer products and services, which are still being developed, can be grouped into three general categories: hardware, custom micro/mainframe interfaces and stand-alone micro packages with optional mainframe "hooks."

Although micros will erode some areas of the RCS vendor's domain, many vendors see micros complementing the mainframe products and services they already provide.

Most RCS vendors have avoided the microcomputer hardware market because of their limited ability to compete in this highly competitive arena. A few vendors have decided to offer hardware, but only on a restricted basis — to time-sharing customers who are understandably confused by the wide range of business micros available and who are seeking comfort in the one-stop-shopping approach. Computer Sciences Corp. (CSC) is offering the IS50 Infostation, a Z80-based micro operating under CP/M. The IS50 comes bundled with proprietary data entry and communications software and also includes Wordstar for word processing and Supercalc for spreadsheet analysis. Control Data Corp. also has a micro that runs under CP/M, the Cybernet 110. This machine is based on CDC's 721 terminal and can be configured to operate as a graphics workstation. Geisco will sell or lease IBM personal computers to their customers when the personal computer is an integral component of a Geisco-developed distributed processing application. Geisco's Time-Sharing Interface program features automatic session files, transmission of non-Ascii executable binary files, Help screens and commands driven by function keys.

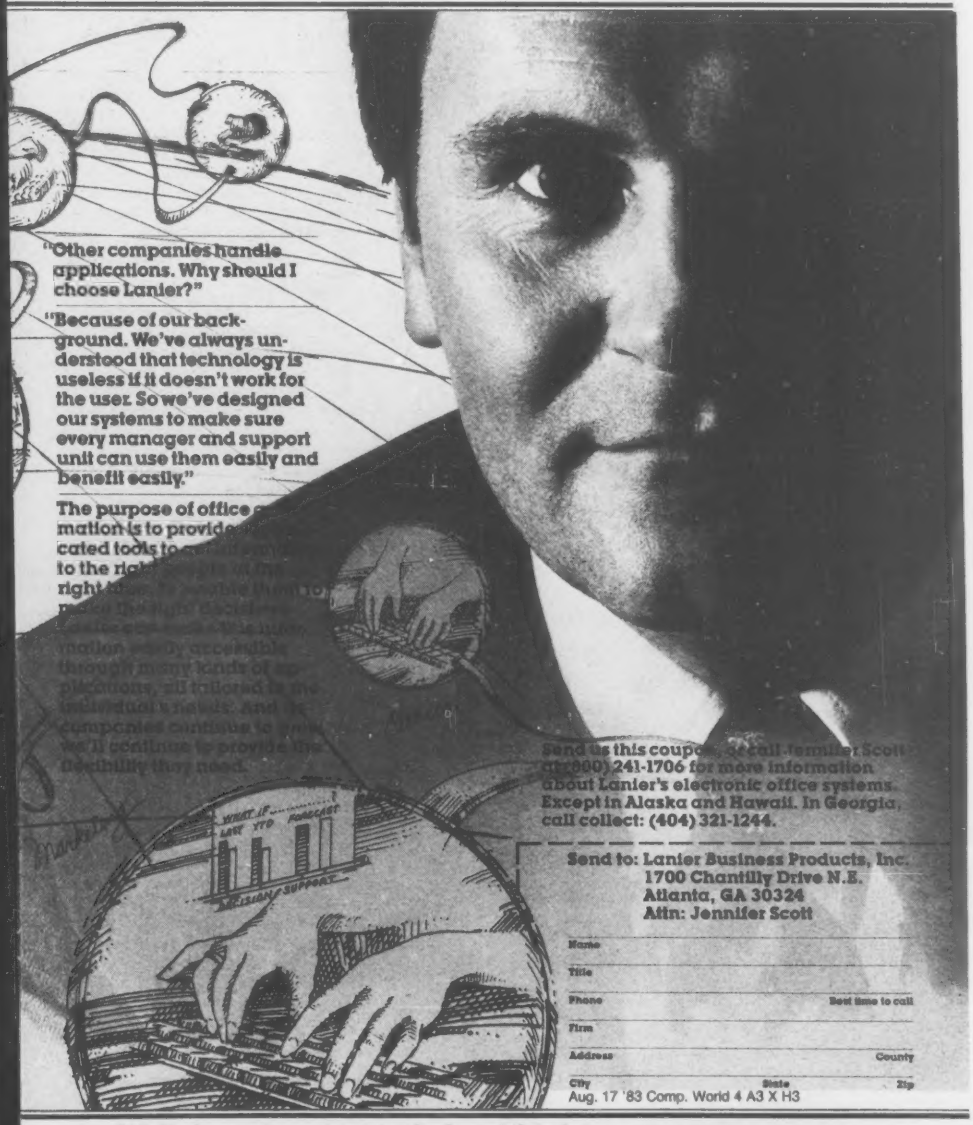
Several RCS vendors offer custom software interfaces that link their mainframe products to popular microcomputer packages, most notably Visicalc. Citishare's Mainline, for example, allows a user to extract security prices, dividends and so on from the Citiquote data base and save them for local analysis with Visicalc and other micro programs.

In 1982, Data Resources, Inc. (DRI), in a joint venture with Visicorp, introduced Visilink/Datakits. Visilink is a menu-driven communications package that allows the user to order and receive economic and financial information from DRI. This information is transmitted in preformatted Visicalc worksheets called Datakits. These Datakits can also be purchased from DRI on a prerecorded floppy disk for certain specific time series.

Informatics General Corp. is also working with Visicorp to develop a package to link micros and mainframes. Visianswer, the microcomputer program, will act as a query system; Answer/DB, the mainframe component, will process the query, downloading the retrieved files or information to the micro.

Micro software that can be used in a stand-alone fashion as well as in conjunction with mainframe systems is also being developed and made available by RCS vendors. Comshare, Inc. offers Micro W, a financial modeling system for the Apple II and the IBM Personal Computer. Micro W not only provides a stand-alone modeling capability for smaller modeling needs, but also can be used to implement a distributed planning system in which micro-based models can be accessed and consolidated into a centralized

"Flexibility."
Frank Rice, Product Manager, Electronic Office Systems Division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data base on the host computer using System W. Similar packages are also available from Ross Systems (Maps/Pro), UIS (Micro-Foresight) and others. The increasing availability of a micro version of the mainframe DBMS (for example, PC/Focus) will provide a parallel capability in the data management area.

In 1982, to solidify their position regarding micros, Comshare acquired a microcomputer software developer, Target Software, and is now marketing the Target product line to its time-sharing customers and other interested parties. Target packages include spreadsheet, financial modeling, graphics, and scheduling applications.

One OA objective is to support and improve managers' decision-making capabilities — decisions that often require information and data not included in departmental or corporate data bases.

One of the more elaborate and complex microcomputer packages being offered by an RCS vendor is Boeing Computer Service's Boeing Intelligent Terminal System (Bits), a family of multifunctional software modules operating under the UCSD P-System. Available Bits modules include:

- The Intelligent Terminal Workstation (communications and a full-screen editor).
- The Business Management Workstation (spreadsheet and business graphics).
- The Data Entry Workstation (forms generator and error checking).
- The Text Processing Workstation (word processing).

Additional modules, including a relational data base and report writer, are scheduled for release later in 1983.

One objective of OA is to support and improve the decision-making capabilities of the managerial and professional staff. These decisions often require information and data not included in the departmental or corporate data bases. Many RCS vendors offer a wide variety of external data bases to fill these information "gaps."

Within this area of data base services three vendors stand out — ADP, DRI and Chase Econometrics Interactive Data Corp. Each is a full-line vendor covering econometric and financial information, as well as securities and similar capital markets data, on both a national and international basis. In addition, each vendor augments these offerings with demographic and marketing data bases — information frequently used in conjunction with econometric and financial analyses. All three offer some industry-specific data, but the industries they emphasize are different.

DRI's Visilink/Datakit offering extends its data base services to the microcomputer user. ADP's Datapath provides an interface between its data bases and Lotus 1-2-3. Many of the data base authors — for example, Evans Economics — and vendors will probably develop custom interfaces between their data bases and popular micro products. Data bases of the 1980s share characteristics of the CPUs in the 1960's. They are large (no one needs a whole one), very expensive to maintain and require "techies" to keep them current. RCS vendors are a logical source to provide this information to OA environments.

If RCS vendors, through networks, applications software, external data bases and microcomputer interfaces, have a role to play in the development of personal computing services, then there is also a role for them in an office systems strategy.

Because computer service economics is no longer based on processing logic but on a shared information resource, corporations seeking true OA environments would be wise to monitor RCS vendor activity to discover ways they can best take advantage of the plethora of rapidly emerging offerings. OA

Walton is a senior consultant wich Real Decisions Corp., a Stamford, Conn.-based consulting firm with an emphasis in the time-sharing industry.

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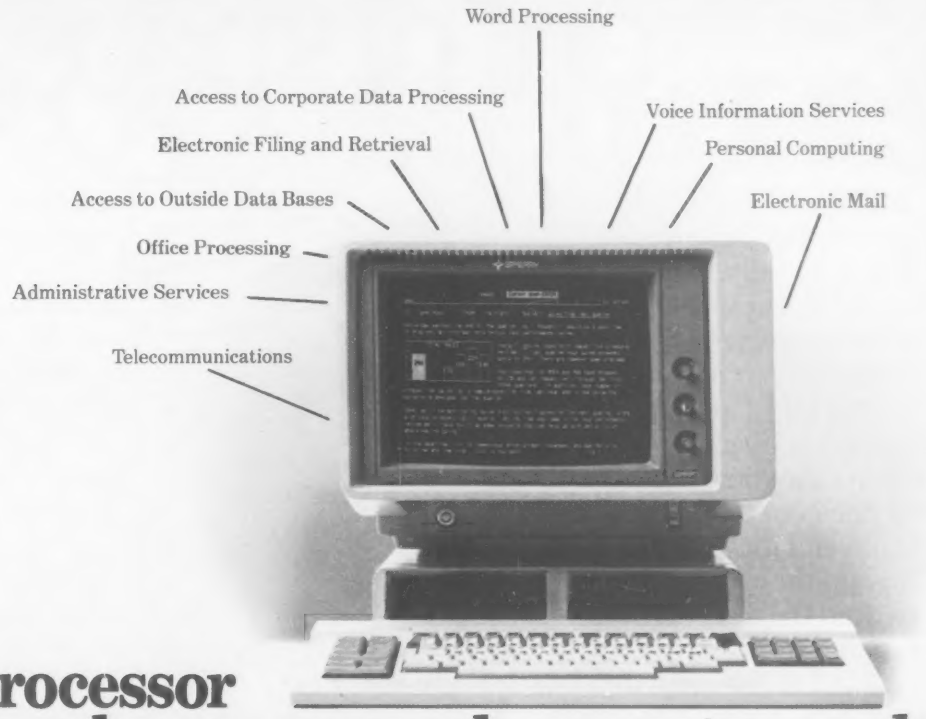

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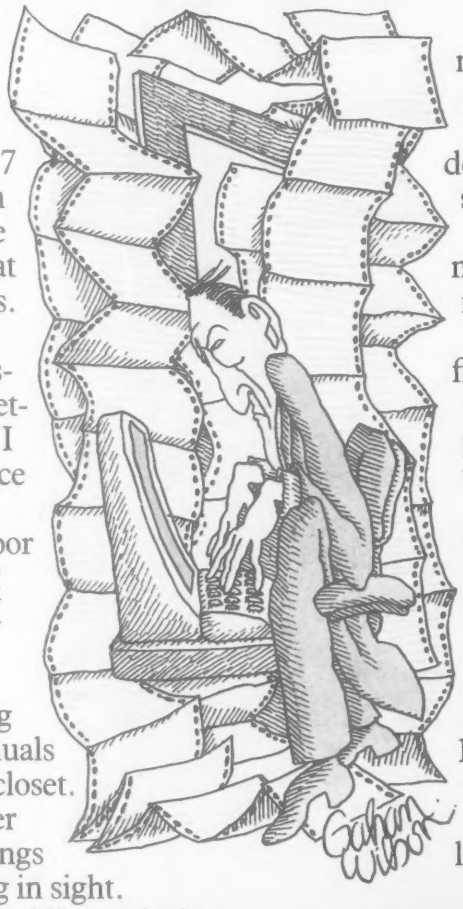

It all seems like a bad dream. But I know now that it was anything but.

I had spent the last 7 months up to my pixcels in a massive project for a little known outfit in Kuwait that I'm not at liberty to discuss.

Anyhow, I had stepped out for a quick pastrami and mayo and was getting off the elevator, when I noticed the door to the office bulging strangely.

I threw open the door and there it was. The most insidious, revolting thing I had ever seen.

Paper.

Printouts strangling the CRTs. Reference manuals running amok in the coat closet. Microfiche razing the water cooler. Even program listings were devouring everything in sight.

If only somebody had listened when I told them about Wright Line's new work-in-process filing products.

If only they had listened when I told them about Wright Line's Docu-Mate® closed containers, media drawer modules and workstation mobiles. And how each one is designed to put every last inch of workstation space to use.

Didn't they hear me when I told them how Wright Line could help us file project materials of all shapes and sizes in one place? Or how all this was only part of a whole system of information media management designed to increase productivity as much as 25%?

A system of filing devices, cabinets and work surfaces whose sole purpose is the ruthlessly efficient management of project materials.

A system with the flexibility to be shaped to virtually any work style, personal preference or workstation environment.

I beg you. Don't make the same mistake we did. Wright Line has a brochure that goes into the entire system in great detail. Send for it. The address is: Advertising, Dept. 3OA, 160 Gold Star Boulevard, Worcester, MA 01606. But do it now. Before it's too late.

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The newest additions to the InfoMedia™ system: *Docu-Mate® closed container.* A place for project materials of any size, any shape – without binding. *Media drawer modules.* In printout and letter-size width, for mobile or fixed applications. *Workstation mobiles.* The maximization of floor space and easy access to information.

OA FOCUS: MICROCOMPUTERS

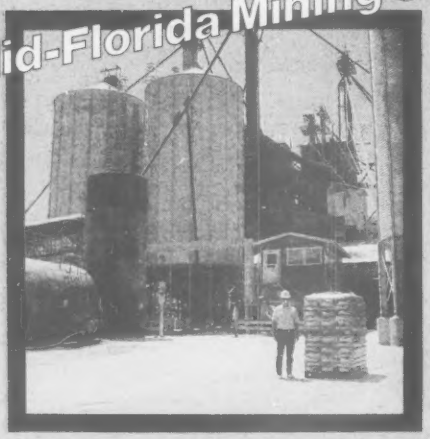
Microcomputers are the hot topic in the office today. They're not just simple little machines that will come in and solve all your organization's problems, however. They bring with them new sets of problems, new capabilities and a whole office full of new users. In this issue, "OA Focus" spotlights the microcomputer and how it can help you most.

Purchasing Micros 37
Conquering Microphobia 47
WP Software for Micros 51
Protecting Your Data 59
The Micro/Mainframe Link 65

Who Uses CompuPro?

Those who get the best without gutting the budget. Meet a few.

Mid-Florida Mining Co.



Although it owns a large minicomputer, Mid-Florida Mining Company is turning more and more frequently to its microcomputer — made by **CompuPro**.

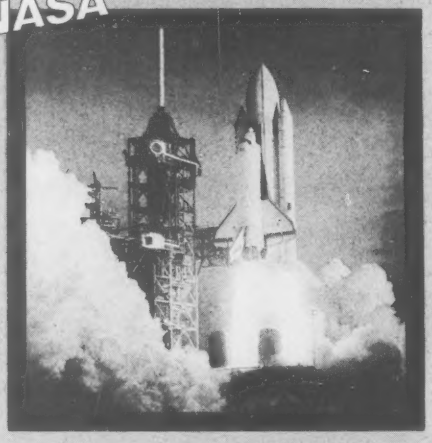
"It's more flexible," explains Allen Edgar, president of the tri-state operation that turns a unique absorbent clay into a broad line of products ranging from cat litter to jet fuel filtrate.

The problem with the mini, according to chief financial officer Michael Wilkinson, is that modifying its programs requires expensive and time-consuming outside programming. By contrast, the firm is adding new applications to the **CompuPro** so fast that in one year it has taken on inventory control, production scheduling, sales figures, invoicing, customer lists and even executive flight planning. All of it easily accessible.

Sales and marketing coordinator Tasha Reid, a prime user of the system, went from being thoroughly frightened of and dissatisfied with computers to warning, "Whoever takes my **CompuPro** computer away from me..."

Mid-Florida Mining Company's **CompuPro** system was integrated by Micro Computer Technology of Brandon, Fla.

NASA

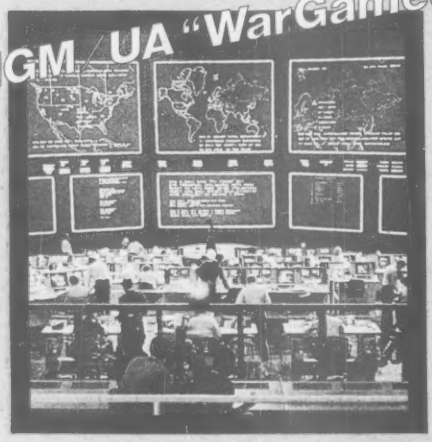


In a giant testing facility in Mississippi, the engines of America's grandest scientific enterprise are constantly being perfected. Now, four **CompuPro** systems are coming on-line to help NASA's engineers access the results of testing the space shuttle's powerful motors.

One **CompuPro** system will control the onboard computer during hot-testing, when speed and reliability are crucial. Another will replace old-fashioned strip-chart recorders, storing and retrieving the torrent of data.

The information that now fills many boxes will soon fit into just one — a **CompuPro**. And that will help NASA achieve something for which it has become famous — paving the way for spinoff developments in the private sector.

MGM/UA "WarGames"



More than 100 highly placed military strategists, one scientist and one very ingenious young computer hobbyist used **CompuPro** systems — in MGM/UA's new film, "WarGames."

Two off-stage **CompuPro** systems ran a variety of on-screen computers, creating clever effects programmed by the film's computer consultant, Steve Grumette.

For a gigantic war-room set, Mr. Grumette programmed 120 monitors to flash hundreds of different battle plans at eye-boggling speed — all using just two **CompuPro** systems. He credits **CompuPro's** high operating speed and optional solid state disk drive with making that scene possible. "We couldn't have done it with any other machine because at that time there wasn't any other M-Drive," he said.

Reliability was another reason that Mr. Grumette chose **CompuPro**. As he put it, "When people are busy making a movie, they don't want to wait for somebody to run out and get a printed circuit board fixed."

BOREXCO

BOREXCO finds oil. It sounds simple but Borehole Exploration Corporation relies heavily on a sophisticated system of computer-generated, two-and three-dimensional magnetic models.

Another state-of-the-art system — from **CompuPro** — digests the megabytes of sensitive measurements that are recorded during BOREXCO's survey flights over hundreds of miles of terrain.

CompuPro's speed, reliability and cost-effectiveness won the respect of BOREXCO's engineering director, Dr. Brad Rehm. "I looked at others and I could not get this level of performance at several times the price," Dr. Rehm said.

Also, the **CompuPro** has trimmed BOREXCO's timesharing costs on a big minicomputer by as much as $7,000 a month. All of that without a single breakdown in two years.

What makes **CompuPro** systems so widely used and just as widely respected?

Performance, quality and reliability.

Mr. Wilkinson, Mr. Grumette, Dr. Rehm and NASA's test crew have impressive credentials in their fields. Maybe that's why they chose a computer with such a solid reputation.

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Purchasing Micros

No one is surprised anymore to see microcomputers appearing with greater frequency on employees' desks. But questions about how the product gets from the factory to the user's desk have not yet been fully answered. The acquisition question is critical, not only from the important budgetary standpoint, but also from future support, software and integration standpoints. There is no single best way to purchase microcomputers. The individual needs of a corporation will dictate the best method of acquisition.

Most corporations with more than 1,000 employees now have some committee or job function with the set purpose of determining what personal computers to use, who gets to use them and how to use them. Management information systems (MIS) has the critical role in this process. Not only does MIS have computer expertise, but also it will necessarily be involved in a few years, when these users want access to the host. One key part of any successful plan for implementing personal computers will be directing purchases and resultant support and service issues. As the number of dollars spent on personal computing increases, it will be necessary to have detailed plans in place in order to maximize discounts and minimize related costs.

By Aaron Goldberg

If you have a Personal Computer PCI speaks your language.

The PCI 1076 protocol converter from Protocol Computers, Inc. can support your Personal Computer – Apple, Cannon, DEC, Hewlett Packard, IBM-PC, Kaypro, NEC, Osborne, Sanyo, Sony, Tandy/Radio Shack, MOD, Xerox, etc, etc, etc – in IBM's SNA/SDLC world.

Simply, conveniently, economically, the PCI 1076 makes IBM SNA hosts talk to your Personal Computer in its own language. It converts the Personal Computer's ASCII code to appear as the SNA/SDLC protocol used by IBM hosts, and vice versa. But before showing you how we support Personal Computers in IBM's world, here's how to support your own Personal Computer vocabulary.

GLOSSARY:

ASCII (American Standard Code for Information Interchange) The language spoken by most Personal Computers.

ASYNCHRONOUS Low speed, low cost modems used with most Personal Computers.

BSC Some Personal Computers support, via existing programs, the BSC (Bisync) protocol. See PCI 71B/SNA for SNA-compatibility.

CoaxFACE™ Exclusive PCI converter allows you to drive Personal Computer using standard coax cable, without re-cabling with RS-232C.

FULL SCREEN The ability to modify an entire CRT screen of data without interruption of host.

MODEMS Provide terminal/CPU digital interface into an analog signal for the phone lines.

and want to talk to IBM,

PaperCRT™ ASCII hard copy keyboard terminals have all the versatility of 3278 CRTs with this PCI option.
PCI (Protocol Computers, Inc.). We're making the non-IBM world IBM-compatible.
SDLC (Synchronous Data Link Control). Expeditor for moving data in IBM systems.
SNA (System Network Architecture). Network for moving data in IBM systems.
SNA/SDLC Non-compatible with Personal Computers' ASCII language (without PCI).
SYNCHRONOUS High speed, high cost communications device for communications with host computers.
PCI 71B/SNA When using Bisync running on the Personal Computer, PCI 71B/SNA protocol converter makes it SNA-compatible.
PCI 78 Networker™ Keystroke for keystroke 3278 keyboard compatible terminal.
PCI 1076 Makes Personal Computers function as 3278s.
3274/76 IBM controllers which support 3278, 3287 devices in an SNA/SDLC network.
3278/3287 IBM's CRT; IBM's printer.

HOW PCI SPEAKS THEIR LANGUAGE.

The PCI 1076 facilitates communication to and from the Personal Computer with absolutely no change in host application programs. When you use your Personal Computer's display and keyboard, they appear and function as 3278s.

If you need printed reports, PCI's exclusive "Dynamic Printer Assignment" feature addresses the Personal Computer's printer as if it were a 3287 over a single communication line. And, the PCI 1076 allows the Personal Computer's diskette to store data from, and send information to the host system.

PERSONAL CONNECTIONS.

The PCI 1076 gives you tremendous flexibility for those locations with PCs.

- Make a direct connection using standard RS-232C cable.
- You can connect-up with existing coax cable, eliminating the need to re-cable with RS-232C. Using coax from 5 to 5,000 feet, the Personal Computer may be installed at the remote end, the PCI 1076 in place of 3274/76s – and the RS-232C conversion is provided by PCI's CoaxFACE.™
- You can connect to existing 2-wire twisted pair cables installing the Personal Computer at the end of a point-to-point link with the use of our asynchronous line devices.
- Or, you can take your Personal Computer home, on the road, wherever. To make an asynchronous ASCII dial-in connection, simply use low cost modems and acoustic couplers.

PCI OPENS YOUR OPTIONS.

The PCI 1076 has a graphics terminal interface that lets you use ASCII graphics terminals on your SNA/SDLC network as 3278s. With our PaperCRT,™ ASCII hard copy keyboard terminals have all the flexibility of 3278s, including capability to full screen edit on paper with portable hard copy terminals from anywhere in the world – just pick up the phone.

If you'd like to hear more, our PCI 1076 speaks for itself. Call PCI today for a demonstration unit.

ALSO AVAILABLE:

1067: SNA/SDLC to ASCII 3767 emulation. The NTO alternative.
1051: ASCII to Sys 34/36/38 5250 emulation.
71B/SNA: BSC 3271 to SNA/SDLC 3274 emulation.
75B/SNA: BSC 3275 to SNA/SDLC 3276 emulation.
1071: ASCII to BSC 3270 emulation.
73SX: SNA/SDLC through X.25 connection interface.
1076X: ASCII to 3270 SNA/SDLC through X.25 networks. (With PAD included.)
Videotex 67: SNA/SDLC to Videotex protocol conversion.
PCI 51 Networker: Keystroke for keystroke 5251 keyboard compatible ASCII CRT.
PCI 7887 Plus: IBM-PC software package for 3270 emulation.
PCI 5156 Plus: IBM-PC software package for Sys 34/36/38 emulation.

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PCI **Making the non-IBM world IBM compatible.**

The most striking development in this large corporate market in the last 12 months has been the speed with which these organizations have learned, planned and started to implement personal computing. During June of 1982, at least half the large corporations in an International Data Corp. (IDC) survey had no plan for personal computers in place; of this group, many had not even developed a committee.

Exactly one year later, the situation has totally changed. Fewer than 10% of all large companies are without a written plan for personal computer usage; of those without this blueprint, nearly all are developing one for implementation in the next year at the latest. Despite moving at the corporate equivalent of the speed of light, however, users continue to purchase personal computers on an ad hoc basis.

Source	1982 %	1983 %
Direct Sales	90	47
Dealer/Distributor	10	50
Retail Store	30	31
Other	—	4
No Answer/Not Sure	7	16

Figure 1. Source of Micros

The time and expense companies spend developing these plans would seem to indicate that methods and sources for buying these systems are written in concrete.

This is most certainly not the case. IDC research has shown that, for all the personal computer inventory the MIS group lists, double or even triple this number of personal computers are often in use in the corporation — and without sanction. Although this trend is abating, especially in companies with proactive MIS groups, eliminating end-user purchases is almost impossible.

Buying Patterns for Corporate Personal Computers: The corporate customer can purchase personal computers (both multiple and single units) from a number of different places. Figure 1 shows the source of personal computers for corporate customers for both 1982 and 1983. This data is evidence that more and more personal computer purchases are being made from resellers and fewer from the direct manufacturer sales force.

The implications of this trend are important. Although the headlines tell of thousand-unit purchases and million-dollar deals, the preponderance of resellers in the charts indicates smaller deals are still more common. In fact, the large increase in dealer business is very indicative of the importance of local support and service.

When this data is collected for 1984, the percentages will undoubtedly have changed even more. At some point in time, the largest percentage of sales to the corporate environment will go to the direct sales force of the manufacturers.

Two trends support this: the growing discounts available to those who order large numbers (more than 200) of personal computers, and the trend toward mandating personal computer use among professional and technical employees.

As fewer systems are purchased on an ad hoc basis, the big losers will likely be the retailers and dealers. The overriding comparison that will guide users in choosing one channel over another will be low price/low support vs. high price/high support.

Relative Pros and Cons for Different Channels:

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3M diskettes are made at 3M. That way, we have complete control over the entire manufacturing process. And you can have complete confidence in the reliability of every 3M diskette you buy.

Look in the Yellow Pages under Computer Supplies and Parts for the 3M distributor nearest you. In Canada, write 3M Canada, Inc., London, Ontario. If it's worth remembering, it's worth 3M diskettes.

3M hears you...

3M

Deciding on a distribution channel for the purchase of a personal computer will have far-reaching effects on the use, support and price paid. Each channel of distribution has strengths and weaknesses.

As the market for personal computers in the large organization exploded, cognoscenti agreed that the direct sales force would have the easiest time selling to the large user and that the IBM salespeople who had had the account for the last 20 years would be hard to beat.

The direct sales force has important advantages: They should be able to offer the lowest price — after all, they do build the box. In addition, the direct salesman has account knowledge; he knows your operation and what you need. He also represents a large organization that will support the user and provide maintenance.

These three strengths would seem to provide answers MIS employees seek, but there are problems. Delivery of systems can take anywhere from two weeks to three months. Also, when the salesperson is not around, who can you go to? Telephone tag can present untold miseries when the vice-president of finance's personal computer is the one that breaks or that needs extra memory.

Dealer/Distributor: These sellers generally offer a higher level of expertise than that available from generic retail stores. Most offer a limited range of products and are well versed in these products. These resellers have the advantage of being highly versed in the personal computer products and they offer a high degree of support. In addition, some degree of customization is available, as well as specific training and maintenance.

The primary drawbacks center around the cost of the systems and the stability of the dealer/distributor. These can be important deficiencies, but they are occasionally offset by the high level of support and training.

Retail Computer Store: The retail store is certainly the most visible channel for the purchase of personal computers. Many single systems purchased in an ad hoc manner are obtained from computer stores.

The retail store is often "handier" than other channels and does offer some important advantages. The support and service they offer are not at the same level as the dealer's, but nevertheless are highly useful. In addition, users can take advantage of the storefront operation and go there to expedite service, supply or add-on needs.

Deciding on a distribution channel will have far-reaching effects on the use, support and price paid.

Most computer retail stores offer a broad range of products, and this can be important to the organization that wants to offer more than one or two systems. Some stores are willing to give a discount on total purchase value regardless of who manufactures it.

The drawbacks to the retail store should also be noted.

Most stores do not offer the high level of training and support many users will demand, and equipment service is usually done on a depot basis. In

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In the world's largest computer market, we publish a series of publications covering different aspects of the computer world. Our largest publication, with more than half-a-million readers every week, is *Computerworld*, a weekly newspaper aimed primarily at larger computer users. Its companion publications include *Computerworld OA*, covering Office Automation; *Computerworld on Communications*, a semiannual; and a series of *Buyer's Guides* covering all major segments of the industry.

In addition, we publish *ISO WORLD* for Independent Sales Organizations, including dealers, distributors, retailers and the like.

And, to cover the microcomputer market, we have two publications: *InfoWorld*, a weekly newspaper filled with up-to-the-minute editorial coverage of interest to all micro users; and *PC World*, a monthly magazine dedicated to users of the IBM PC.

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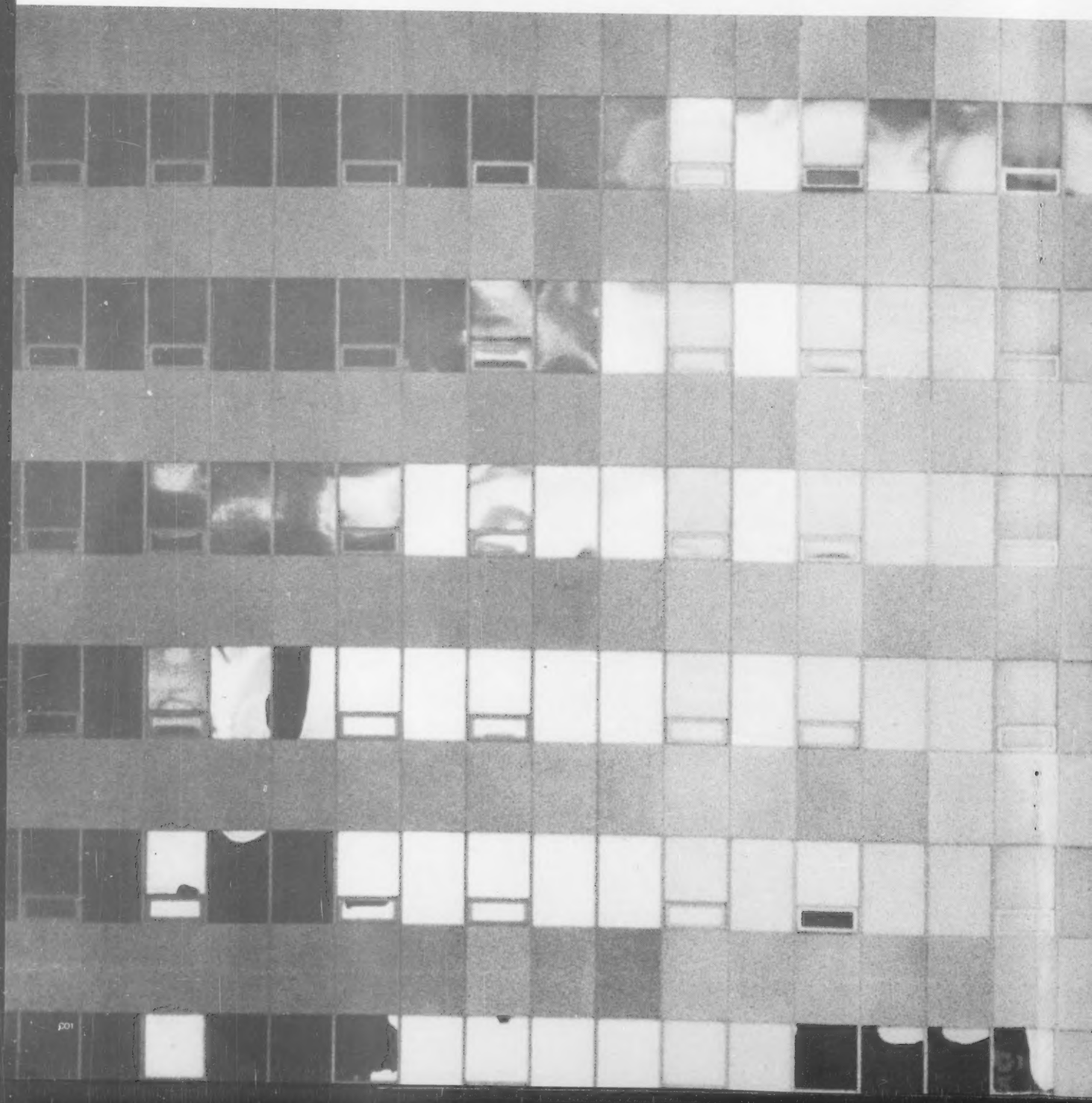

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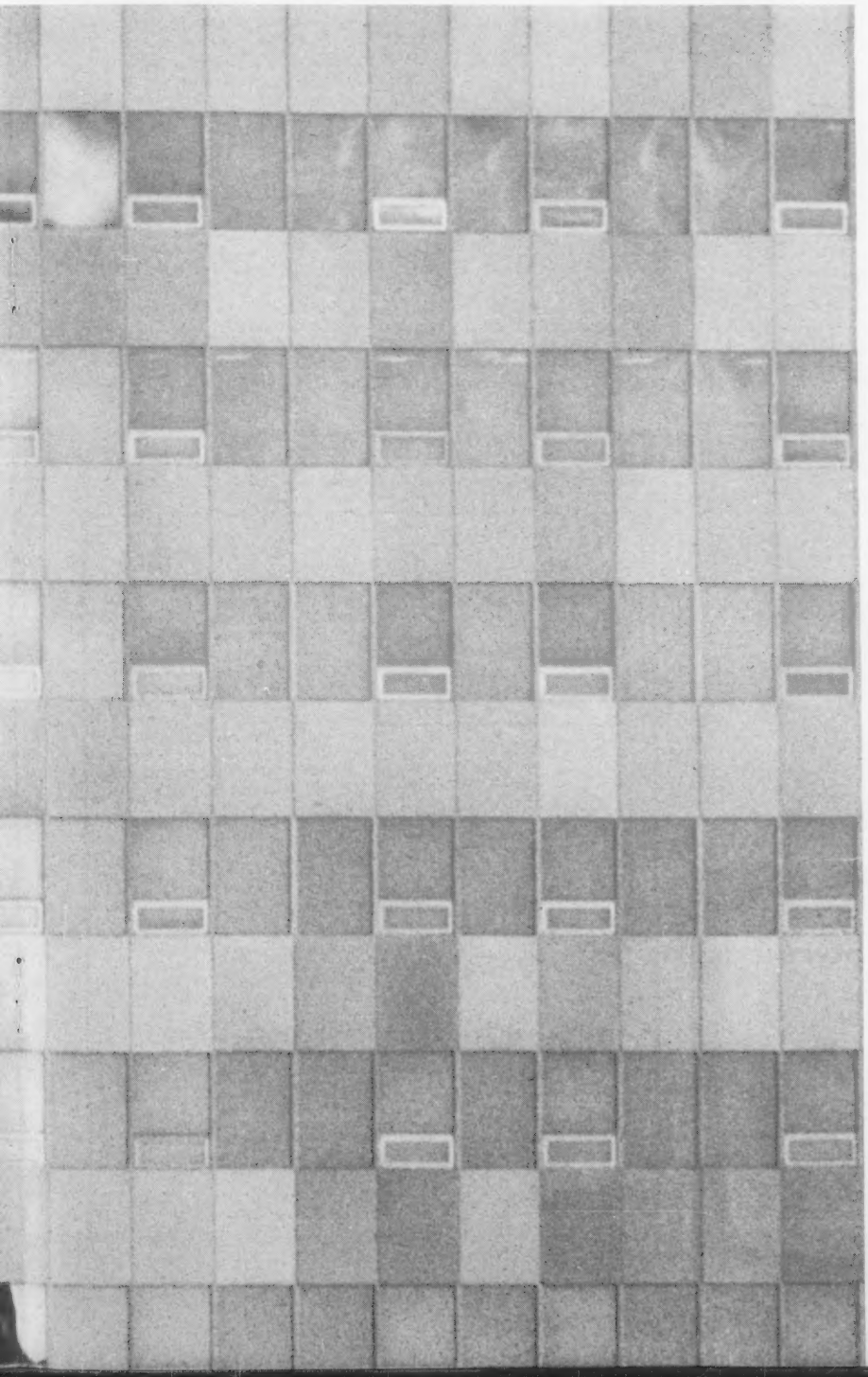

Suddenly, every computer company seems to have two new words in its vocabulary: office automation.

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addition, the viability of the specific computer store has yet to be proven.

One wild card exists in the area of distribution — the in-house computer store. It could be the best answer for a number of large organizations. Gillette Corp. has been a pioneer in this area and is a good example of implementation of the in-house computer store alternative. The in-house computer store offers a number of benefits. Service and support are now under the direct control of the organization, as is training, which can be critical for implementation success. From an organizational synergy standpoint, one benefit truly stands out: MIS will be involved and knowledgeable about personal computers because in most cases, *MIS runs the store.* From the corporate political standpoint, the benefits are twofold: MIS is perceived as being responsive to user needs, and MIS is given more resources to perform this larger job.

However, the in-house computer store does have drawbacks. The costs involved in setting it up are usually quite large. Staffing can become a problem, especially if in-house employees have to be trained and educated. In addition, if the store "experiment" turns into a fiasco, it may leave the MIS department in a difficult position.

Buying Personal Computers and the Role of MIS: The most important part of deciding upon a method of purchase for your organizations' personal computers is assessing the MIS group's role in relation to personal computers. Three distinct paths are open for the MIS organization: Mandate, Recommend and Ignore. In the Mandate plan, MIS approves everything, and systems are allowed only as MIS dictates — in short, MIS controls every aspect.

In the Recommend plan, MIS provides some urging and reasons for following suggestions, but users are allowed to make some determinations on their own. The support carrot is the tool most often used as a spur by MIS.

Under the Ignore plan (also known as the Ostrich approach), personal computers are totally ignored. Three years from now, when the 500 different personal computers become part of the distributed resource system, MIS will realize this was not a good plan.

	Mandate	Recommend	Ignore
Hardware	Only hardware used is provided by MIS	Certain models or vendors are suggested	Anything goes
	No end-user developed	Some end-user developed	Some end-user developed
Software	Limited number of packages offers	Reliance on package software	Package software used
	Some MIS-developed software	Little MIS-developed software	No MIS-developed software
Support	MIS provides Significant support	MIS provides Some, but not all support	MIS provides no support
MIS Involvement	MIS controls every aspect	MIS and end-user share control	User controls all aspects

Figure 2. The MIS role

These short names imply a great deal; Figure 2 contains a more detailed outline of each of these approaches. It should be understood that certain approaches will work for some companies and not for others. These approaches may differ, but certain undeniable truths cannot be ignored. In nearly all cases, large corporate purchases are far less expensive than ad hoc purchases on a per-system basis. Integrating 10 different types of systems is easier than integrating 100 different models. Both for the present and future, key areas are cost and integration, and improvements in these areas cannot be ignored.

MIS cannot wait and let collective wisdom dictate exactly how personal computers will be bought and used. MIS must be proactive so that the personal computers that are installed are installed successfully, and all economies are taken. This is easily possible under both the Mandate and Recommend options. Companies that choose the Ignore strategy should at least reevaluate their options.

Impact on Software: The impact of centralized vs. decentralized buying can easily be seen in the software environment. A number of benefits obtained from centralized buying are reflected in software:

Training is far easier when only one version of the package exists.

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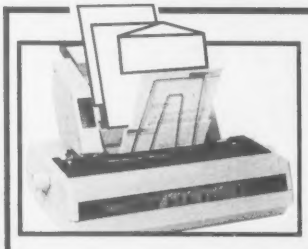

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It is not uncommon for the same package to differ greatly when used on two different systems — function keys, commands and device addressing are common problems.

Although rare, corporate licenses are sometimes available for some software products, and a one-time $20,000 fee is a clear savings when contrasted with 100 copies of a $300 program.

Programs can be quality tested. Good products can then be endorsed; if problems are found, it can be recommended that those programs be avoided. A planned method of disseminating this information is far better than relying on word of mouth.

Centralized buying provides a lever with the software company, resulting in a higher level of support.

Centralized buying also provides an important lever with the software company. Corporate accounts are critical, and software firms are likely to provide a higher level of support to an organization that bought 100 copies of the program than to an individual who bought one copy.

From the end-user standpoint, it is very efficient to be able to give a fellow employee a copy of your diskette with the information on it and to allow that employee to manipulate it. Diskette sharing can almost be a primitive form of a network, a physical packet. In addition, it is comforting to know that if my program disk crashes, someone reasonably near me has a copy of the same program for the same system.

MIS can also develop for the program add-ons or forms — for example, a Visicalc template — that can be used by many of the prospective and present personal computer users.

Centralizing buying has numerous advantages from the software standpoint. Although the number of options available to users may be limited, savings in the areas mentioned above often outweigh this disadvantage.

Effect on Service and Maintenance: Because most systems are relatively new and repairs are minimal, service and maintenance problems of personal computers have not yet assumed the importance they will in the coming years. Also, users are not yet fully dependent on their systems. In time, the professional's personal computer will be as important as the MIS 30 series.

Centralized buying provides important advantages in maintenance. If only a limited number of models are purchased, MIS can possibly stock systems to be used as spares or even to be cannibalized for the necessary board or component. Some organizations are training their own employees in personal computer maintenance, so that service is also done in-house — a concept that fits very well with the in-house computer store.

In summary, the benefits of centralized buying can be very large for some organizations and the costs saved substantial. However, each plan must work synergistically with the organization it serves. Centralized buying will work for most companies, but it must be tailored to provide the best results. OA

Goldberg is research manager of information systems at International Data Corp. in Framingham, Mass.

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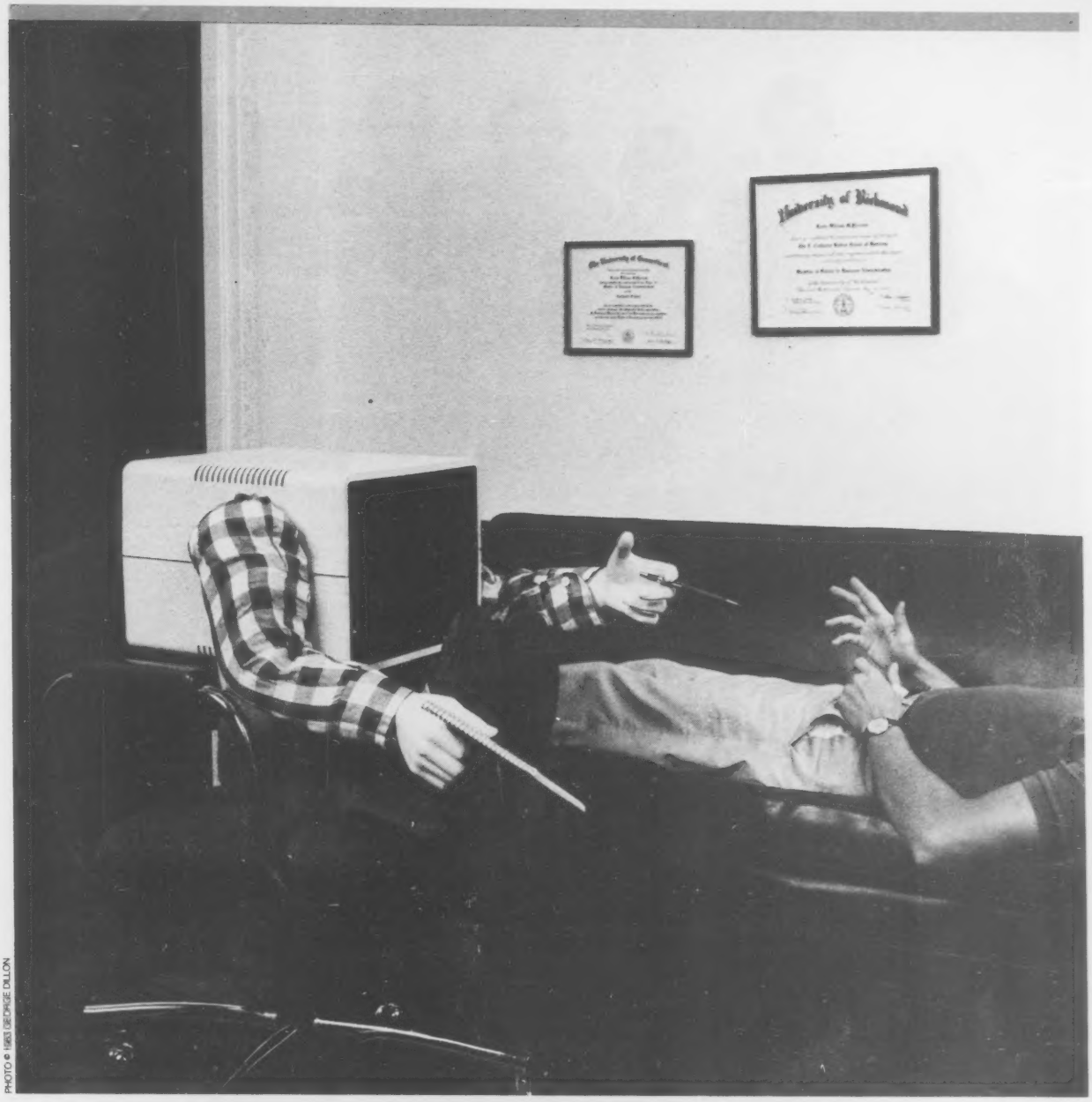

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Conquering Microphobia

Until very recently, when managers thought of computers, they thought of complicated machines located somewhere in an obscure part of the firm, ministered to by a priesthood of engineers and specialists who thought and spoke in a foreign language called computerese. An occasional phone call to request specific data was the only contact a manager had with this mysterious world of wires, circuits, printers and blinking lights.

Today, managers view the computer very differently, and the situation in which they find themselves can be uncomfortable. The computer that was once housed in specially air conditioned rooms can now be found practically everywhere in the firm, from top executives' offices right on down to the stockroom. Known as personal, desktop or occupational computers, these compact units bring the computing power of the giant mainframe right into the manager's office — whether he wants it there or not. Many managers, knowing the micro is fast becoming a major part of business life, are afraid of this new technology and are not fully aware of how it can help them in their work.

Most of America's managerial force is still unfamiliar with computers; as a result, they experience the phenomenon of computer anxiety. Evidence of this condi-

By Dick Powers

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tion can be confirmed by the following surveys:

• Booz, Allen & Hamilton, Inc.: 90% of approximately 10 million executives and professional managers in the U.S. are computer illiterates.

• Lotus Development Corp.: 90% of businessmen in the U.S. suffer anxiety, insecurity and even sweaty palms at the mere thought of using a personal computer.

• Roper: corporate officials resist microtechnology because of a lack of confidence or a fear of losing status.

• Booz, Allen & Hamilton: one-third of all knowledge or information workers are professionals and executives, most of whom are not receptive to the micro.

Instant retrieval of facts and figures, split-second communication, analysis and forecasting in fast yet accurate calculations await these managers at the touch of a key. However, the reluctance spawned by anxiety is confining many of them to traditional business procedures that, in essence, have not changed since the turn of the century. Managers who ignore the micro and its applications run the risk of becoming odd men out in a business world that is gearing up for leaps in productivity and efficiency never before possible.

At the base of the micro anxiety/reluctance syndrome are a number of simple human foibles. Among them are the following:

• Fear of uncertainty. Will they be able to use the micro?

• Fear of peer pressure. They will feel inadequate if they make mistakes in front of superiors, colleagues or secretaries.

• Status consciousness. They consider the use of the keyboard, which is attached to all micros, to be below their corporate station.

• Lack of time. Where do you find time to learn the micro?

Anxiety and reluctance about using micros is especially prevalent among people in their mid-30s or older — managers included. Studies show this age group is highly resistant to the micro because it represents not only a machine they fear, but also one with the power to rearrange traditional office functions. What these managers must be shown is that the micro remains a darkened and dumb terminal without the human element — that people control the machine, not vice versa.

The key to overcoming this anxiety and reluctance lies in the approach to the micro itself. The whole point of microcomputing is that the computer becomes more responsive or user-friendly. The micro is a tool. Managers do not have to become intimidated and frustrated trying to learn what makes the computer go "beep" any more than they have to understand the operating mechanism of an electronic calculator.

However, even with this practical approach, training is essential to overcome reluctance and to begin building computer literacy. There are a number of ways to take the first step, including individual training, company-sponsored in-house tutorial groups and hands-on computer seminars.

Individual training usually means that managers plow through computer texts and magazines in an attempt to train themselves. While such initiative is to be applauded, it does infringe on a manager's time. With only a book as an instructor, a manager may find it difficult to get answers to questions he would like to ask.

In another approach to individual training, the manager can learn from the micro itself. A software tutorial will take him through a program. However, once again, the micro cannot answer or comment on every question the manager may have. Again, the extra time spent may be a source of frustration.

Some businesses have decided to make learning a corporate goal and they provide in-house tutorials. This can be an effective approach. However, the manager is still "at work" and can be called away for meetings and interrupted for any number of reasons.

The hands-on seminar is the third approach to training. The hands-on seminar is usually sponsored by a professional group or a micro vendor. This type of training offers the advantage of allowing the manager to learn in an environment free of work pressures. In addition, it should be run by trainers who can answer questions, demonstrate procedures and render assistance on-site. In an atmosphere free of peer pressures, the manager will learn in the company of other managers, similarly unfamiliar with the micro.

The specific approach used in this type of training varies according to the group sponsoring the session. Generally, the manager trainees receive a brief overview of microcomputing, including an explanation of some buzz words. The major emphasis, however, is usually placed on the face-off between manager and micro. Practical situations may include building a spreadsheet by using depreciation, indirect overhead, fixed costs, unit price, discount and other familiar entries. Another popular application is word processing, which eases the manager into a feel for the relationship between keyboard commands and the manipulation of data or information on the screen.

Although total computer literacy is not attained in one seminar, participants do frequently overcome their initial fear of the micro. Managers can sustain their newly discovered enthusiasm for the micro by joining what are popularly known as "users' groups." In these groups, first-time and veteran end users gather on a regular basis to discuss and learn new software applications programs for various microcomputers, depending on the group. When the groups were originally started, hobbyists and computer specialists met to discuss the technological aspects of the industry. Today, however, the groups tend toward the demonstration of the application program rather than the dissection of an operating system or a diskette.

Managers who ignore the micro and its applications run the risk of becoming odd men out in a business world that is gearing up for leaps in productivity and efficiency never before possible.

The manager should now be well on his way toward becoming computer literate. Armed with the experience gained from the hands-on session and, possibly, from user group membership, he can probably keep himself updated on developments in the microcomputer industry.

However, his problems are not yet behind him. Micro anxiety may surface again when it comes time to actually select a micro system (if he and not the MIS department is the one responsible for selection). The fear of making a mistake will begin to haunt the manager unless he takes time to remove all doubt with a systematic approach to the project.

Managers normally develop a proposal or action plan before taking on a new project. They should, likewise, develop a similar proposal for the acquisition of a microcomputer. In the proposal, a manager must consciously take the time to identify his own needs and to ask not just what the computer can do, but, "What can the computer do for me?"

Initially, a manager may perform a needs analysis to review the need for: timely tracking of delinquent accounts, improved general ledger accounting, more timely and more thorough reports, better methods to update critical mailing lists, better inventory control and quicker and more accurate budgets. Other functions for which the manager may need a microcomputer may include purchase decisions, cash flow projections, cost accounting, departmental budgets, taxes and other critical functions.

To help head off anxiety over installation, support and service of the new system, the manager should choose a reliable vendor that will guarantee these services. The vendor should have local offices in order to provide a prompt response if help is needed.

When installation and training are completed, managers must use patience in learning how to run the micro. Frustration is not an unusual symptom in the early period of use. However, dramatic increases in productivity and efficiency are possible if managers take the extra time to learn how to use the micro and the software properly and completely. During this period, it will be necessary to adhere strictly to the objectives developed in the needs analysis and to take great care to avoid software shortcuts and alterations.

Four developments are already having an impact on the management process, including:

• Managers will be able to integrate different applications into one program — for example, taking the results from a financial spreadsheet and turning them into graphics that add more depth to reports and more substance to planning.

• Mainframe accessibility will allow an executive to take information from the mainframe, work it on his micro and then send it back to the mainframe — either in the original received version or in an updated version.

• Multitasking — the computer's ability to perform more than one application simultaneously and thus save more time — will enable managers to track more than one project while, for example, projecting monthly reports.

• Electronic mail will enable managers and staffs to "micro mail" memos and messages to a data bank for storage at any time — during the day or after hours.

While the microcomputer revolution continues, managers should know trends developing almost overnight will have a great effect on managerial functions. Among those trends is the changing perception of the micro as a personal productivity tool. As advancements take place, the micro will become less personal and more active and integrated. Local-area nets will enable micros to communicate with each other in the same department or between various locations within a firm.

Data base management is another trend that promises to give staff and management greater opportunities to become more interactive. As a result, the individual will become more capable because of a ready access to shared information stored in the data base.

The micro can expand and improve the manager's analytical and decision-making skills. Failure to recognize this fact of computer life may hamper a manager's abilities and, potentially, short circuit his career. OA

Powers is a director of computer products marketing at Monroe Systems for Business in Morris Plains, N.J.

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WP Software For Micros

Some 20 years ago, IBM introduced the MTST, a machine that would mark the beginning of a new era in the office. Today, the MTST is obsolete, but the concept upon which it was based — the automation of repetitive work — remains the raison d'etre for office automation in the '80s.

Although contemporary OA consists of many technologies, word processing remains the keystone. For the business community, it is fast becoming as indispensable as the telephone.

Word processing has matured greatly since the days of the MTST. One-line-display word processors appeared in short order and they, in turn, were followed by CRT-based systems. The growth of the WP industry involved speed and proportions which astounded even the most optimistic of entrepreneurs.

After a period of coasting characterized mainly by the development of advanced software functions and the refinement of existing ones, office technology began to change its basic structure. Most medium-size to large organizations had some form of dedicated word processor in place, and functionality was usually equal to need.

At this point, the research and development community turned its efforts toward developing different ways

By Lawrence F. Vogel

to present the tried-and-true WP product. OA systems combining WP with other office tools began to appear in large companies. At the same time, the burgeoning growth of the microcomputer industry gave rise to the first generation of widely available WP software packages for micros. Software developers found the new micro WP software was no easy task — in many cases, they had to reinvent the wheel for each piece of hardware and each operating system.

Recently, vendors have made a distinction between the terms "personal computer" and "professional computer." This important demarcation also applies to the world of software: The professional level has much higher standards; only when those standards are met will the micro be a useful and productive office tool. Personal-level software can be useful in many cases, but in this article the requirements of a professional office will be used to measure software traits.

A help facility is only as good as the information it contains.

Until very recently, micro WP software has not been a viable business tool for three reasons:

- Microcomputer hardware is produced to be multifunctional. Its design is primarily DP-oriented and creates a tough obstacle.
- Because of the hardware design, the software structure is often code-intensive, which creates a poor user interface. Office personnel are often unable or unwilling to learn more than minimal codes.
- The level of functionality frequently fails to measure up to that found on even low-end dedicated word processors.

From a management point of view, the user interface is one of the most important aspects of a computer-based office product. A poor user interface means greatly increased training time and underutilized equipment, both of which translate directly into dollars and cents. Valuable time is lost if a user either does a task manually because of the cumbersome nature of the computer-based process or must constantly refer to documentation. A good user interface is readily understood by the user. The user must, at any point, understand what functions are available and how to implement them.

Two basic genres of user interfaces exist: mnemonic codes and function keys. Function keys (usually with a template or key caps to identify the keys) are easiest to use, but codes are also acceptable if they are explained on the screen, either through the use of windows or menus. Problems can occur when codes overlap — for example, does "p" mean print, paragraph or page? Except for Apple Computer, Inc.'s Lisa, the mouse interface is not common on personal computer WP packages.

Help facilities bring an explanation to the screen when desired, and they can be a great aid to the user. However, a help facility is only as good as the information contained in it. If the help facility tells the operator the underscore key causes a section of text to be underscored, but fails to explain how to do it (and undo it), the help facility is simply a waste of disk space.

To test a user interface,

recruit an experienced user of dedicated WP equipment. Have that person use the micro WP software for 15 minutes. The user interface is probably well-designed if, without instruction, he can perform basic functions like creating a document; entering, moving and deleting text; filing the document; and displaying and indexing documents.

The best user interface would require only that the user switch on the computer, and the rest would be fully explained. This type of interface has yet to appear, but as micros become more common, the industry is moving closer to this goal.

When all the characteristics of a good user interface are in place, we need a good way to get rid of them. The industry is beginning to recognize that there are different levels of users. Beginners and occasional users need an interface to guide them through each and every process. The frequent user must be able to move easily through functions without having to deal with menus and prompts that slow their work. In the next generation of WP software, a layered approach to user interfaces will emerge and will allow users to specify their level of expertise.

In functionality as in the hardware/user interface area, the micro must be compared with its dedicated WP counterpart. Few WP packages have approached the level of functionality found on even the low-end "writer" class of dedicated stand-alones. Among the necessary functions are background functions; displaying text as it will be printed — proportionally spaced, justified and so on; list/merge; spelling verifications; and records processing. Although these functions are sometimes available as different (and sometimes semi-compatible) packages, they must be offered as an integral part of the micro WP software package whether optional or not.

Some software has begun to address this issue by allowing files created under one package (a spreadsheet, for example) to be integrated into WP. Available implementations are not wonderful, but at least they indicate that software houses recognize the need to address the integration issue.

The industry is beginning to recognize that there are different levels of users.

It seems there are more WP packages on the market than words in this article. They can be classed into three basic categories: first, second and third generation. First-generation software is fortunately all but extinct. It represented the first attempts at mass marketing micro WP. Second-generation software is characterized by a somewhat higher degree of functionality, but usually with correspondingly lower ease of use. Third-generation software is a preview of what future packages will look like.

What follows is a quick viewpoint on only a few available packages. The list has most of the very common packages and a few other fairly new products from companies with "a better idea." It makes no claim to be comprehensive and is illustrative only.

Easywriter II is a very logical enhanced version of Easywriter. It has adequate functionality for use in business, but the user interface could use some

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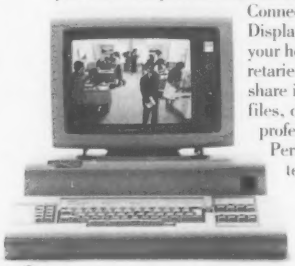

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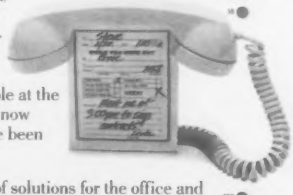

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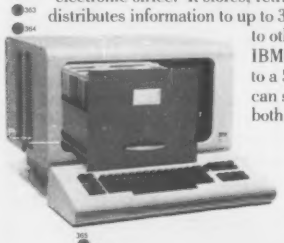

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improvement. (Information Unlimited Software, Inc., Sausalito, Calif.)

Perfect Writer is an interesting package that runs under CP/M. It is one of the first to make reasonably good use of windowing — the ability to edit two files simultaneously. (Perfect Software, Inc., Berkeley, Calif.)

Scripsit was designed specifically for the Radio Shack TRS-80. From a functional standpoint, it is adequate but not outstanding. However, it is sold through Radio Shack's large chain of stores and support, although informal, is reputed to be good. (Tandy Radio Shack, Fort Worth, Texas.)

The microcomputer continues to be viewed as the breakthrough of the '80s, but the rate of software development has not kept pace with the blinding rate seen in hardware.

NBI now offers its WP software on the IBM Personal Computer. The level of functionality is parallel with their Docuwriter. NBI has one of the best standalone word processors in the industry; for that reason, it probably justifies its comparatively high price. It should be noted that the price includes additional hardware which must be added to the IBM Personal Computer. (NBI, Inc., Boulder, Colo.)

Samna Word is a newly introduced package from a new start-up company. The user interface is very good — fortunately, not at the expense of functionality. Expect to see much more from this organization. (Samna Corp., Atlanta, Ga.)

Horizon Word Processing is a fairly good product, although it runs under the Unix operating system. If IBM supports Unix in the near future, Horizon will be at the forefront. Otherwise, OEM agreements with hardware manufacturers like Altos Computer Systems, Inc. will continue to make up the bulk of its sales. (Horizon Software Systems, Inc., San Francisco, Calif.)

Wordstar was one of the first packages to achieve wide national distribution and now offers a number of ancillary packages such as list/merge and spelling verification. Unfortunately, the user interface has not received much attention. (Micropro International Corp., San Raphael, Calif.)

The microcomputer rage does not show signs of stopping. The micro continues to be viewed as the breakthrough of the '80s, but the rate of software development has not kept pace with the blinding rate seen in hardware. Through the '80s, the micro will continue to become an integral part of the office, both as a standalone unit and as a workstation on an integrated network. By the time the furious fight for a place in the market wanes, vendors of both software and hardware will have developed products that efficiently and thoroughly address the needs of the office. Fortunately, that time is not far away. OA

Vogel is a staff consultant with The Office Systems Consulting Group, Inc., a Cambridge, Mass., firm specializing in services to OA users and vendors.

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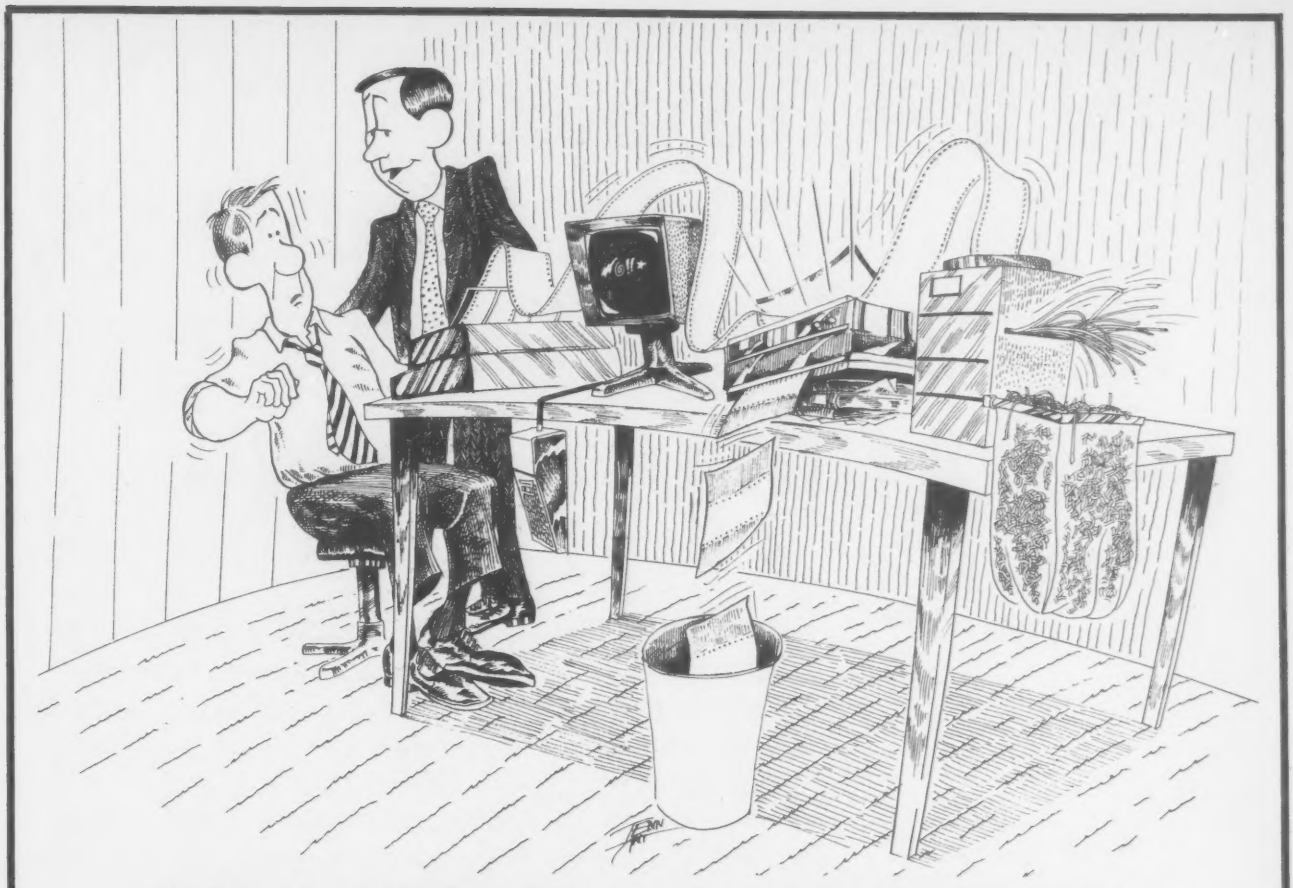

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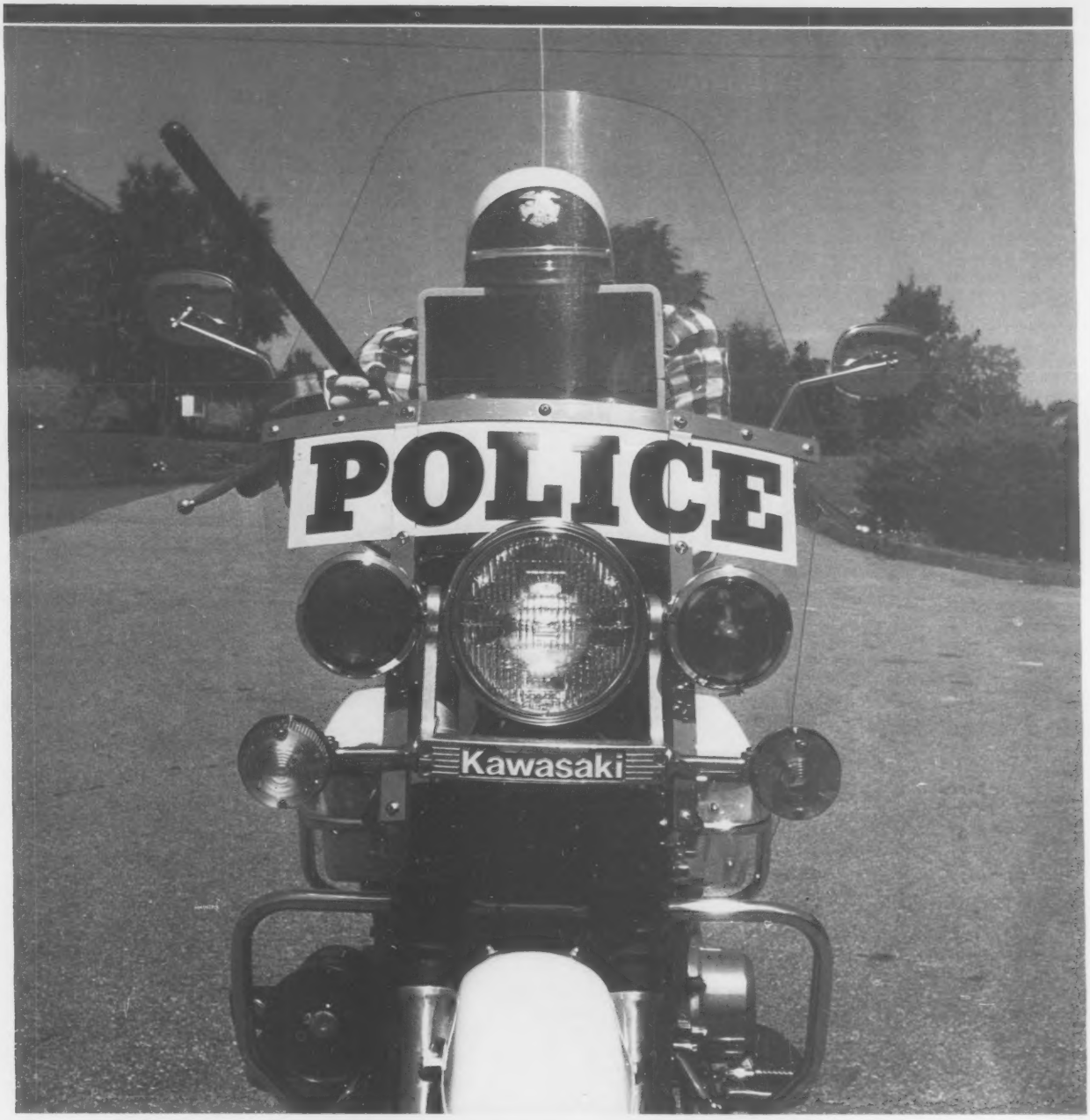


Protecting Your Data

The microcomputer, that compact package of processing power, has added a new dimension to computer security problems. As the micro skyrockets in popularity (an estimated 19 million will be sold by 1986), it will inevitably fall into the hands of those with less than honorable intent.

However, calamities caused by personal computers in the hands of criminals may appear minor in comparison with the potential problems the microcomputer brings to the office. As the micro surges into the office environment, the issue of security looms larger to beleaguered management information systems (MIS) departments that have already lived through the problems of securing the mainframe arena.

DP departments, adjusting to the micro as an often integral part of OA, view the product as a double-edged sword. As a stand-alone unit or part of a network, it inevitably will relieve a significant chunk of DP backlog and spread computing power and data to previously untouched areas of the organization. At the same time, the micro greatly increases traditional computer security problems while introducing a whole series of new and unique problems for data security.

Computer security experts as well as data security

By Glenn Rifkin

officers agree the microcomputer presents a serious challenge.

The major concern is that, because of more pressing problems, micro security will remain a low priority. "The micro environment is growing so rapidly, there simply hasn't been time for security to catch up," said Robert Wilk, president of the International Association for Computer Systems Security (Iacss) in Dix Hills, N.Y.

'The micro environment is growing so rapidly, there simply hasn't been time for security to catch up.'

Although computer crime is tailor-made for the micro, the concerns surrounding micro security vary widely. Among the major security risks are unauthorized access to data bases, data integrity, hackers, disaster recovery, vandalism, movement of data off site and the physical safety of both hardware and software. Many of these are no different from problems faced with remote terminals. However, because it spreads computer literacy to a greater number of workers, the micro has dramatically increased the risk of computer crime and both man-made and natural disasters.

Security experts believe the single most important item on the security agenda is end-user education. The end user must be made fully aware of the importance of the equipment being used and how it should be handled. The list ranges from the mundane, such as locking floppy disks in drawers at night, to impressing people with the significance of the data bases to which they now have access.

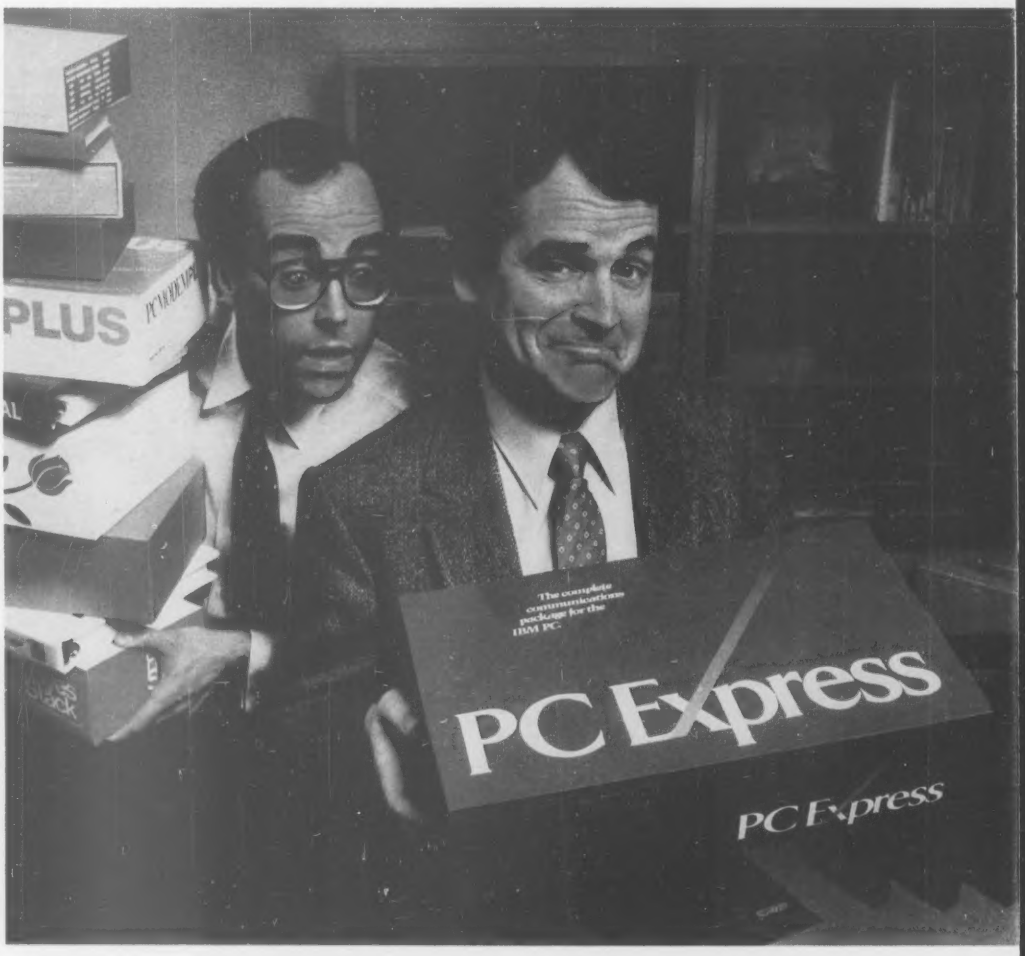
"In the DP era, when only a limited number of people had access to data bases, those people had an awareness of the sensitivity of the data," explained Alan F. Westin, professor of public law and government at Columbia University. "Now there are micros on desks of people not sensitized to the power of proprietary information. The organization must carry training to large numbers of people in that area."

Ironically, the majority of organizations involved in OA have very little awareness of the problems, according to Donn B. Parker, a computer crime expert with Stanford Research Institute in Menlo Park, Calif. "I gave a talk on computer security to a group of office information people a year and a half ago, and it was the first they had heard about these security problems. 'We've never had security in the office before. Why start now?' was their reaction."

Parker pointed out that OA people believe that if security is not demanded, it isn't necessary: "It's going to take more crime problems before people realize their vulnerability."

Organizations tend to fall into one of three categories when it comes to security, according to Westin, who is also a consultant on computer privacy.

With OA moving in such a hybrid fashion, the majority haven't given security any thought at all. A second group has some security awareness, but the task at hand is getting systems hooked up and people on line. For them, security is a low priority. A very small percentage of organizations have a general strategic plan to bring security into the OA environment.



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"Those are the smart ones," Westin stated. "They are anticipating, rather than waiting for disaster to happen."

As computing capabilities move from centralized DP under the watchful eye of the MIS group to a distributed environment, the opportunity for misuse of the computer grows. Security policies that could be monitored centrally must now be policed on a widespread basis throughout the company. Organizations must take responsibility for making the rules clear and explicit so that the end user becomes accountable for the micro in his care.

This type of security begins by setting up controls on the purchases of micros within the organization. Although it is "extremely difficult" to stop people from buying what they want, MIS must act as a consultant and strongly advise the end user, Wilk said. Otherwise, there will be a "hodgepodge" of hardware and software that could be impossible to secure if a disaster should occur.

At Chrysler Corp. in Detroit, personal computers are installed in just such a controlled manner. Paul Anders, manager of information systems planning, said end users must demonstrate a specific necessity for a micro before it can be installed. Chrysler is strictly a one-vendor operation, according to Anders, and anyone requesting a micro will get a Xerox Corp. 820.

Chrysler is starting an information center pilot program, which will eventually merge with its OA program. The information center concept, while opening up more data than was available on time-sharing, presents some "pretty scary security questions," according to Anders.

"We have to establish rules for access and need to know. We have to face the security issue before we put the micro in their hands. Communications and networking are where the problem is introduced. It is not a security issue until they have access to the data base," according to Anders.

The micro's portability presents a major problem — the threat of physical theft is everpresent.

At Standard Oil of California, the basic Chevron data security policy lists the concerns as well as a usage statement for its end users. A policy statement specifically geared to the micro is being drafted and will be ready by the year's end.

John Brown, staff specialist for computer security, said he feels the micro's portability presents a major problem. Because of the diminutive size of both the hardware and the disks, the threat of physical theft is everpresent.

"There's a higher probability of having both the program and data stored on the same floppy," he said. "And this causes great problems if it is stolen."

According to security experts in the Silicon Valley, a large black market for personal computers as well as for the microchips that form the heart of the system already exists. "I see Osbornes secured to desks with big heavy chains and padlocks," Parker said.

Several accessory firms, such as Anchor Pad International, Inc. of Marina Del Ray, Calif., have begun to market ergonomically designed systems that secure the micro to the work

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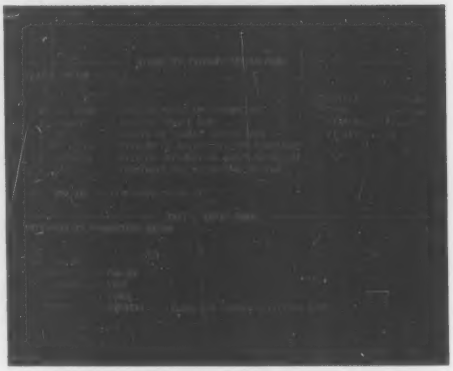

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area to avoid theft. Companies like the Zurich Depository Corp. in Manhasset, N.Y., are opening facilities with state-of-the-art vaults and safety deposit boxes specifically for storing corporate backup data.

As the micro spreads throughout the organization, the DP and data security groups must be relentless in espousing commonsense procedures. Security people are amazed at horror stories of floppy disks used as coasters for coffee mugs or stored on window sills, and micros, on-line to data bases, left unattended. "Employees must be made aware of the risks so they can be held accountable," Wilk stated. "There is an attitude of 'it will never happen to us.' Then, when they get burned, the company hands us [security consultants] a blank check."

Security people are amazed at horror stories of floppy disks used as coasters for coffee mugs or stored on window sills, and of micros, on-line to data bases, left unattended. There is an attitude of 'It will never happen to us.'

Beyond the physical security of the hardware and software, unauthorized access to data bases using micros has struck fear in the hearts of data security people. There is currently little more available than password controls to secure the micro from intrusion, and some companies don't even use those, according to Tim Schabeck, vice-president of Computer Protection Systems, Inc., a Plymouth, Mich., consulting firm.

File access controls built into the software will eventually become available for small systems in much the same way they exist for mainframes. Such innovative solutions as Leemah Corp.'s Secure Access Unit (SAU) have targeted the dial-up access problem.

SAU answers an incoming call to the data base and must receive the correct Touch-Tone identification number. At that point, SAU emits an acknowledgment tone and disconnects. It then searches its directory for the telephone number of the authorized location and calls the user back. At the site, the user enters a one-digit connection code that permits entry to the data base. If the caller has an invalid code, the system logs the fraudulent entry attempt.

Data encryption — the scrambling and encoding of data — offers another possible solution, but Parker and others believe the widespread use of that method is eight to 10 years away.

Once a relatively secure data sanctuary, the MIS department now faces the difficult problem of ensuring data integrity within a distributed data processing environment. As a stand-alone unit with access to corporate data bases, the micro is the perfect purveyor of inaccurate and damaging data, either accidentally or otherwise. According to some estimates, 40% to 60% of computer-related problems occur at the data entry area.

At Cigna Corp. in Hartford, Conn., data integrity is among the highest priorities in the micro security arena. Jane Paradise, information security officer for the insurance firm, stressed the necessity for strict controls on what information is being stored and who is doing the storage. Business management has got to understand and accept the risks in using micros. "DP cannot accept risks or responsibility for data it does not own," she said.

Companies must do periodic auditing of data to ensure integrity, Westin said, and pointed to one particular company in which management reserves the right to observe what is being stored on micros. "As long as the organization walks a careful line against becoming oppressive, a well-balanced system has to be examined periodically. The need to apply tried and true DP security procedures in the OA environment is essential."

Of course, even the best security procedures cannot guarantee success. As networks of information begin to flow from unit to unit, the chances of security problems arising becomes even greater. In electronic form, information is invisible and can be manipulated in a variety of ways.

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*3Com Corp. in March Systems & Software, pg. 118
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Disgruntled employees bent on sabotage or vandalism are difficult to detect and control. "These people can do a lot more damage without detection using a micro in an automated office," Parker said. Also, information in the DP area is usually in a raw and unintelligible form. In the office, the data on micros is more likely to be in the form of readable letters or reports, and therefore it is more vulnerable.

Computer hackers have created endless MIS nightmares and the micro will likely increase the incidence of unwanted intrusion. Brown of Standard Oil personally monitors the hacker problem by checking hacker havens, where codes are distributed on bulletin boards.

Susan Nycum is a lawyer specializing in computer crime, with the Palo Alto, Calif., firm of Gaston, Snow and Ely Bartlett, and she has already seen a number of micro-related intrusions lead to fraud and other scams within organizations. The incidence of micro-related crime will grow simply because of the large number of people using them, according to Nycum, and the legal system will have to adjust accordingly. "The business laws in our legal system are 50 years old. In the 1930s, we were subject to a whole different set of business practices to which those laws applied. The laws will have to change to conform to what's happening now."

According to Iacss President Wilk, the organizations themselves should be pushing for more government regulations and computer crime bills such as H.R. 1092, the Federal Computer Systems Protection Act, sponsored by Rep. Bill Nelson (D-Fla.). "You need good input to get good workable laws," Wilk added.

Of course, evil intent is not a necessity in creating a breach in security. Disasters, due to human error or Mother Nature, are of paramount concern to data security specialists. "The problems won't be of criminal intent as much as those of carelessness, loss of information or the exposure of information to the wrong people," Paradise said.

Data security people believe prevention in this area is, again, related to education of employees. Backup files must be made and stored safely in virtually every instance. "Providing backup copies of files is a tradition in DP departments," explained Parker. "Office workers will learn quickly after they lose one or two important files."

"In terms of disaster recovery, I think of three words — protection, detection and correction. You must protect the asset, detect the violation and that may result in the need for correction. You've got to be able to recover from disasters — both natural and manmade," Standard Oil's Brown added.

A growing factor in disaster recovery is computer insurance, an area one expert called "a sleeping giant in the security issue." Microcomputer insurance policies are beginning to appear, and "when the insurance business sees the potential in this area, it will have a very positive effect on the security problem," Parker said. The better controls a company has on its computer system, the more savings it will realize in insurance coverage. In this way, the insurance business will eventually have great leverage on computer security.

The implementation of data security relating to the micro has, in fact, become something of a political football within organizations. Should the MIS department, the traditional bearer of computing responsibility, shoulder the burden for both policymaking and policing the micro environment?

By its very nature, the micro is intended to promote user independence. End users getting their first taste of computer power most likely will provide resistance to corporate policies dictating micro use. With its computer expertise, the DP department seems the natural source for micro security. But should DPers become the scapegoats for the inevitable security problems?

"There is a great diversity of where the power is structured," Westin said. "In some companies, MIS is the best place to handle it — in others, the human resources office or the controller's office in financial matters. If it becomes an MIS function, it must be handled with sensitivity."

Wilk found no set pattern to where the data security people come from. He said politics often dictates the hierarchy and the major problem with micros is that they are spreading corporate security and control people even thinner.

At Chrysler, Anders pointed out that DP will simply carry out the dictates of the end user. "The Payroll Department owns the payroll file. MIS will only administer the rules; we won't make the rules."

According to Brown, micros haven't as yet presented a political problem at Standard Oil. "There are as many different reactions to data security as there are people with micros. I've been supported in what I needed to get done. The biggest problem is that when networks become more interconnected, you don't have the basic controls to develop accountability. The micro increases that problem even more. Accountability is the fundamental problem."

Perhaps the crucial factor in micro security lies in its status within the corporation. Data security people agree that, despite its obvious importance, security is simply not a high-priority issue. Vendors and users have directed their energies to the installation of hardware and software within the office. They are looking for maximum power, compatibility and cost-justification. Security on the micro is considered tomorrow's headache.

"Some people say 'the company has only $5,000 tied up in the micro; it's not worth that much attention.' But the company might have $5 million worth of information stored in that computer, and that is how you have to measure the value," Parker commented.

Paradise of Cigna Corp. feels it is even less complex. "Security boils down to people — the integrity of people. They've just got to do their jobs and know the risks." OA

Rifkin is a staff writer with Computerworld OA.

'Some people say "The company has only $5,000 tied up in the micro; it's not worth that much attention." But the company might have $5 million worth of information stored in that computer, and that is how you have to measure the value.'

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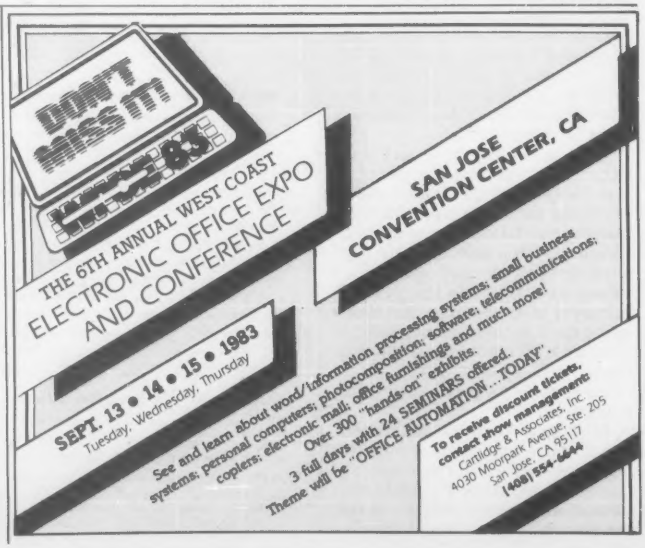
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The Micro/Mainframe Link

The integration of microcomputers into large computing environments is a key management issue in the computer industry. Confirmation can be seen in the number of announcements made in the first half of 1983 of products that tie micros to mainframes, including:

• McCormack & Dodge Corp., in conjunction with Lotus Development Corp., announced a product that ties mainframe application software to 1, 2, 3.

• On-Line Software International announced Omnilink, a mainframe/micro connection.

• Cullinet Software, Inc., in conjunction with Apple Computer, Inc., announced a link from IDMS to Apple's Lisa.

• Informatics General Corp., in conjunction with Visicorp, announced Visianswer, which extracts for all data bases to Visicalc.

Both DP professionals and end users take issue over what the role of the microcomputer should be in large

By Merritt M. Lutz

companies. Opinions range from those of the micro proponents, who see all or most of future DP being performed by microcomputers, to those of the mainframe supporters, who don't think micros can do anything better than mainframes. In the middle are end users and DP professionals, wondering whether micro/mainframe integration is an idea whose time has come or a promise that cannot be effectively delivered.

We arrived at our present situation by means of a process that began 20 years ago, when upper management in large organizations began to understand the importance of DP. If information and experience could be centralized and made available to information workers or decision makers in a timely fashion, then that organization would surely have a competitive edge. Central site computers offered this potential.

Micro/mainframe integration — an idea whose time has come or a promise that cannot be delivered?

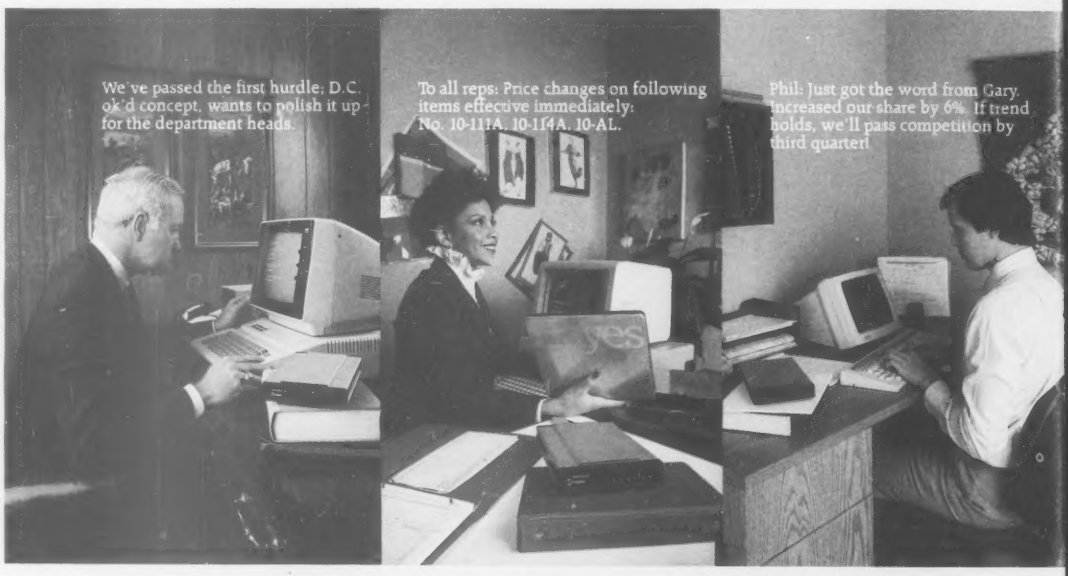
Data base software, although embryonic at the time, held out promise. During that period, strong centralized DP organizations were taking shape. Because of hardware cost, building administrative or backbone applications was and has been the major role of these DP organizations. Originally, these systems were substitutes for expensive and inefficient manual or mechanical bookkeeping systems. These were batch processing, hard-copy and report-oriented systems, and the end user was the clerk.

The information available to managers was restricted to what could be printed on a report, the contents of which had to be specified at the time the system was designed. If a manager's information needs changed, requests had to be made to DP to program a new report. Another problem was the manager might not be within easy delivery distance of the computer printer — meaning the report might arrive with obsolete data.

DP was just beginning to shape and direct the business world. The technology of the time determined what information the users would see and which users would be served.

Later, third-generation hardware and software became more versatile and upper management reassessed the importance and sensitivity of the corporation's information to its future survival. The DP professional was directed to make information available to professionals, analysts, managers and executives — the information workers. In addition to making data available, the DP professional was told to make it relevant, accurate and secure. This meant providing more than a number-crunching capability for the company.

More recently, newer technology gave birth to centrally controlled on-line systems for new users, utilizing a different set of applications. On-line capability generated a new requirement for administrative systems called inquiry. Using this function, a higher level end user began to appear who was a more direct user of the system. This manager's job was not to put data into the system nor to read static reports, but to use information for unpredictable purposes. DP was making the data available, relevant, secure and accurate. The user was getting up-to-date production information under the con-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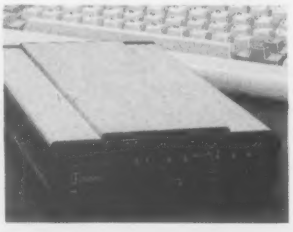

they operate with rotary dial, Touch-Tone** and key-set systems. At full or half duplex. And both Smartmodems feature self-test capabilities.

Hayes Smartmodems are available at two different speeds and price levels. The lower-priced Smartmodem 300 is ideal for local data swaps and communicates at 300 bps. For longer distance and higher volumes, Smartmodem 1200 transmits at 1200 bps or up to 300 bps, with a built-in speed selector that automatically detects transmission speeds.

We've also included indicator lights that let users see what their Smartmodem is doing, while an audio speaker lets them hear it. (Is the remote system down, or was the line just busy? This way, they'll know.)

Hayes has prepared a directory of the many communications pro-

trol of DP, which was continuing to affect corporate decision-making processes by controlling and shaping data usage. DP's strategic assignment in combination with available technology again led to the development of different classes of information users.

In the '70s, a new DP requirement surfaced — analysis. Here the user is interested not in reports, but in interfacing with data to solve problems. The user is a manager or an analyst working for a manager. Originally restricted to scientific DP, analysis functions began to appear in the business world under the auspices of time-sharing services. Because the hardware required was so large and expensive, it made sense to share the costs by using outside time-sharing.

Now in the '80s, specialized tools have been developed in two high-profile areas: the application development center, for the DP professional who needs specialized tools for efficient, timely implementation of major applications; and by end users in the mainframe information center for departmental and/or one-time applications. These centers are driving forces in today's DP world. In them, DP professionals, utilizing state-of-the-art software concepts, grapple with the total strategic assignment of availability, relevancy, accuracy and security. They are logical technical and historical extensions of systems first implemented 20 years ago.

Over the last three years, a completely new type of DP analysis tool has appeared from an unexpected place. While nobody was watching, a revolution was occurring. Business professionals (managers, executives, analysts and accountants) started buying microcomputers. They bought them not for their homes (as the industry thought they would), but for solving business problems.

Unlike time-sharing, these tools look at DP from a user's perspective. Microcomputers were not developed from the corporate-strategy point of view. They did not concern themselves with relevancy, accuracy and security of the corporate information resource. They are democratic and do not require DP expertise or DP control. Because of this apparent conflict with the management information systems (MIS) strategic role, these users have not been able to participate in the usage of the corporate production data base.

Micros were not developed from a corporate strategy point of view.

Perhaps the biggest driving force behind this revolution is one piece of microcomputer software — Visicalc. More than 500,000 Visicalc packages are currently in use by business professionals, many of whom have had no computer training. For their analysis functions, these people want more and more personal computers and productivity tools like Visicalc.

As good as Visicalc is, managers and professionals use it so much that they have exposed a new need. They want to do their analysis work on actual data — corporate data — and they don't want to enter it themselves. Clearly this is where the need for the micro/mainframe connection is most obvious. What is also obvious is the opportunity for chaos.

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Result Codes: (can be numerical/verbose): 0/OK: Command line ok. 1/Connect: Carrier detected. 2/Ring: Phone is ringing. 3/No Carrier: Carrier lost or never heard. 4/Error: Error in command line. 5/Connect 1200: Carrier detected at 1200 bps. (For Smartmodem 1200 only.)
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Modem Capability: Bell System 103 or 212A compatible originate or answer mode for Smartmodem 1200; Bell System 103 compatible originate or answer mode for Smartmodem 300.
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Transmit Level: –10dBm.
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Users want reliable, accurate and relevant data; they are relatively unconcerned with security. What they also want is a combination of current data from the administrative system and the easy-to-use productivity tools available on personal computers. Unlike the elite world of mainframes, information centers and time-sharing analysis — which are characterized by copied data, shared data bases and special languages — this new world is open, personal and available to everybody.

We have a crisis at hand. Enthusiastic end users and senior executives, not fully understanding the technical realities of DP, are seeing the promise of DP about to be fulfilled. They are on the verge of storming the walls of the DP department, taking the initiative from MIS and somehow drawing the micro and mainframe information worlds together themselves if the DP professional does not respond.

How real is this conflict? How much at odds are end-user demands and DP requirements? What end users are really requesting is exactly what DP is good at delivering: reliable, accurate, relevant and secure data. Why has it not yet happened? Why is micro/mainframe integration more a proposal than a reality? Not because DP is standing in the way of progress. It is merely doing the job it has been chartered to do. However, that job is not so simple as some people make it sound.

Many DP managers have characterized the overall situation as chaos. An unbelievable number and variety of software tools and systems are offered all across the DP spectrum. All promise the end user, manager and professional access to the corporate information resource and the ability to make the job easy — a dream come true. To upper management, daily announcements of new products hold out the exciting possibility of leveraging that large data base investment.

To the DP professional, this chaos is a headache! DP's careful, deliberate response to this mess is interpreted as negative and sometimes even hostile. Unfortunately, the DP manager ends up at odds with users and, many times, with the boss. Upper management does not comprehend that the continuing technology "promise" in DP many times is unfulfilled. It needs careful implementation with quality, strategic software and hardware. DP managers seem to be the only ones concerned about relevancy, accuracy and security, in addition to availability. Fortunately, they understand this world all too well. They look for the right solution for the long term.

Are these much-maligned DP managers — who are considered slow moving, contrary, tedious and even hostile — really the problem? The overall problem they see is that people want nonstrategic, nontraditional, short-term software solutions applied to important strategic areas. DP professionals know what must be done. The future is at stake. They apply high-quality strategic solutions. They want to be the solution, not the problem, and the solution will take two important directions.

The first is that DP professionals recognize the existing application development center and information center concepts are not entirely adequate for the future, although they have served administrative, inquiry and analysis needs well until now. The new end user is a manager or professional skilled in business principles, but unskilled in computers. He has embraced microcomputers and wants mainframe data for them. This requirement calls for a new approach, which can be called the personal information center. It is based on the following principles:

- Access is to current central computer production data bases, not to copies of yesterday's data.
- Data is delivered to both traditional mainframe terminals and personal computers, depending on the user's requirements.
- Intelligent, selective access to this data is available for personal computer users, not just terminal emulation.
- Data appears in the format the user needs. If the data is going to be used in a spreadsheet, the user should get spreadsheet formats.
- Control and security stays where it belongs, in the hands of central DP.
- Strategic software is not inexpensive, easy to develop, nor easy to recognize.

A crisis is at hand. End users and executives are on the verge of storming DP's walls, taking the initiative from MIS and somehow drawing the micro and mainframe information worlds together themselves if the DP professional does not respond.

The second of the two directions mentioned above is, in building for the personal information center, DP will use exactly the same criteria it has already used in building the application center and information center. The charter will remain to make data relevant, accurate, available and secure, and DP will correctly interpret them to make your solutions strategic. DP finds strategic solutions for the personal information center by applying the same tests it has developed over the years. The tests for strategic software are that it must be durable, maintainable and extendable. Durability means it must exist for a long time without significant deterioration. Maintainability preserves software from failure or decline and keeps it in a contemporary state of repair, efficiency or validity. Extendability means the system grows and adapts over time to encompass ever-expanding needs and environments without disruption.

The process that produces these qualities is software engineering, and it must be applied to DP areas critical to a corporation's well being.

With thousands of software offerings, many from new companies, how does the DP professional recognize strategic, engineered software? Despite what most advertising tells the rest of the corporate world, it isn't easy. It takes time, work and money. It's done by closely investigating the vendor. How does the vendor view software engineering? What processes are used? How extendable, maintainable and durable have products been? What do users say? What is the vendor's staying power?

Is this the time for mainframe/micro interaction? The answer is a resounding "Yes . . . but." The need is there. Users know they want it. DP knows it will deliver it. The "but" is that this delivery must be evolutionary and strategic, not revolutionary and chaotic. CA

Lutz is group vice-president of the Software Products Group of Informatics General Corp. in Woodland Hills, Calif.

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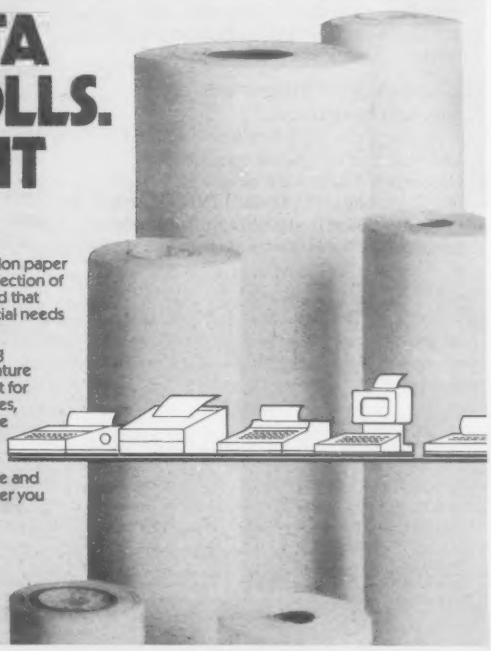

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Will Oil & OA Mix?

ILLUSTRATION BY KRISTIE VANVALKINBURGH

Atlantic Richfield's OA team is gearing up for the future by doing a lot of planning and hard work today.

By Glenn Rifkin

The bridge from oil wells to office automation is a long one. At Atlantic Richfield Co.'s corporate headquarters, office automation has run into numerous roadblocks, but the automators from the Corporate Units Information Services (Cuis) department remain committed to supporting Arco's professional knowledge workers. Despite the obstacles of a downturned economy and a decentralized environment, the OA push at the nation's 12th largest corporation remains strong.

Introducing new office strategies for a $27 billion international oil conglomerate, with 10 operating companies and 50,000 employees, is no easy task, however. Faced with losses in sales and operating revenues in an unstable petroleum market, Arco's major concern is oil wells, not office systems. The recent turn of economic events has clearly broken the momentum the Corporate Systems Department felt it had four years ago when OA first became an Arco priority.

In an attempt to recapture that momentum, the Corporate Systems Department was reorganized in January 1983 into two separate units. The Cuis group, under its manager, Al Smith, was given the task of overseeing and implementing professional computing support within the corporate headquarters in Los Angeles. The Strategic Planning for Information Technology and Services group is responsible for telecommunications, data resources and OA planning on a companywide basis.

Because of the company's size and varied locations, Arco, to date, has instructed each operating company to initiate its own OA strategy. Deanna Bengston, manager of the companywide strategic planning group, pointed out that OA is a relatively small part of her group's responsibilities and, at present, no plans exist to link Arco's operating companies. Each operating company is free to implement its own OA plan and choose its own vendors. The strategic planning group can only make recommendations, offer its expertise and provide education where needed.

At corporate headquarters, OA has

been considered a part of the professional computing umbrella.

Since the Corporate Systems Department first installed a series of IBM 3730s on the desks of several secretaries in 1979, Arco's approach to OA has been on a pilot-by-pilot basis. According to Roseanna McArthur, support consultant responsible for the implementation of OA for Cuis, it became clear as far back as 1979 that many professionals within corporate headquarters also wanted to get their hands on the technology. They could often be found asking the secretaries how to use the terminals for their own needs.

Corporate Systems decided to expand the availability of the equipment in 1980 and put in "casual" workstations where anyone who needed access could get on-line. Training was offered on a one-on-one basis.

The DP managers soon felt that the 3730 was "not the way to go," McArthur said, and in March 1980 they began a pilot program to automate Corporate Systems itself. After an ill-fated trial with Citicorp.'s Axxa system, the group turned to Xerox Corp. and explained the typical functions it sought. Xerox, the group felt, was headed in the right direction.

The pilot began modestly. Seven Xerox 860 Information Processors were brought in and placed on professionals' desks. Another 860 was placed in a demonstration room for casual users. Anxious to accelerate the progress of the program, Corporate Systems turned to Xerox again and in March 1981 installed the Ethernet system within the group. They added 12 more 860s and more casual workstations; by July of that year, the new Xerox Star, complete with mouse and user-friendly icons, joined the pilot. From this local-area network, DP professionals within Corporate Systems were able to get extensive on-line training. In addition, they had, for the first time, the electronic mail, file services, word processing, calendaring and other processing functions they wanted.

A team of researchers from the University of Southern California was brought in to evaluate changes that occurred within the office environment and to measure productivity changes, Thomas W. Moreland, a systems research analyst within Cuis, reported. "It wasn't a classic study, in that we didn't have a control group. But it showed us some trends and validated the information we received."

Although the Corporate Systems pilot was a success, McArthur said, the group took a step back and questioned whether a pilot in a DP group would be taken seriously within the corporation. Of course, a bunch of DPers would respond to the new technology, but how would a non-DP department react to OA? So Cuis searched for a group within corporate headquarters as a test subject.

'In a company that spends millions on oil rigs, cost-justification is an important consideration.'

Under McArthur's direction, the Corporate Units Employee Relations Group (Cuer) was chosen for the pilot. As the center for all personnel needs for the 2,000 Arco employees at corporate headquarters, Cuer was deemed perfect as a test site. The 20 professionals and 23 clerical workers who make up the group were involved in numerous activities that could be facilitated with OA.

McArthur viewed the pilot as vital to providing information on the productivity increases OA could achieve. "In a company that spends millions on oil rigs, cost-justification is an important consideration," she explained. The results of the pilot, it was hoped, could provide corporate guidelines for Arco.

McArthur did extensive interviews with each member of Cuer before and after the pilot. According to her report, the cost-justification and productivity measurements were arrived at by placing the focus on department work groups rather than on individuals. She identified several specific areas where significant cost benefits could be derived, including graphics preparation, reduced document turnaround, reduced overtime and contract labor costs, reduced cost for outside text preparation services and improved responsiveness in correspondence generation.

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seven Xerox 860s, two Xerox 820 personal computers and two Xerox Stars, along with the Ethernet system. Two of the 860s were set up as casual workstations.

"We didn't force anything on anyone," McArthur said. "No one was expected to use the equipment if they didn't want to. We did one-on-one training and held regular meetings. People gravitated toward it."

McArthur's final report showed the Cuer pilot was highly successful in most areas. Staff was able to be reduced by four, a reduction directly attributable to the OA plan. The impact of the new technology was seen in the quality of work produced, changes in work styles, productivity gains and hiring considerations. The cost for the pilot, including hardware and software, was nearly $280,000, but McArthur's analysis showed there was an after-tax return of 39% and a payback period of 25 months, thus proving cost-justification.

"Although office technology has not produced the ultimate solution to all office problems," she noted, "various alternatives are available. The most critical factor in the success of the pilot was not the equipment itself, but rather a three-part implementation strategy: user involvement, phased installations and user acceptance."

Smith agreed: "It was a very impressive project. It was more cost-effective than we thought it would be."

Despite the success of the pilot, the downturned oil economy has somewhat dampened the spirits of the 65-member Cuis. Arco has resisted efforts toward a corporatewide OA strategy or even a single strategy for the corporate headquarters. Smith pointed out that, although Arco's management recognizes productivity as a high-level issue, "put in perspective, this is a relatively small piece of capital to look at."

Smith said Arco has no time frame for its OA implementation. "We are going to bring support to the professional and some level of managers as needed. It depends on a wide number of factors. We are just trying to move at a steady pace."

"We try to find the problem and then offer a solution. We are not interested in proposing solutions where there aren't any problems," McArthur added.

The concept of implementing small but separate OA projects may provide suitable short-term answers, but a concerted effort would provide more benefit to the company in the long run, according to Bengston. Her strategic planning group has felt the frustration of trying to implement a wide number of office technologies in an organization with other priorities. "Because Arco is an oil business, they don't see information services as a very central issue," she pointed out. "We lost a lot of momentum from three years ago and we are trying to regain that. It's difficult though; we don't have a lot of clout."

Bengston said she believes it is appropriate for Arco's 20,000 professional information workers to have workstations, but she can't pinpoint how that will be implemented or at what price the idea would be palatable to the company. Much of the OA headache is a result of the lack of compatibility and lack of standards among the equipment on the market, she said. Corporate headquarters, for example, has a large base of installed equipment (including IBM Displaywriters and Personal Computers, Xerox word processors and a smattering of Hewlett-Packard Co. products), but no plans to link it together in a network.

"The solutions proposed by the vendors are not complete enough," she said. "The advertising is misleading and there is no compatibility. Nobody, as we see it, has the solution as yet."

McArthur admitted that there had been "some problems" with Xerox and Ethernet and that the company was not committed to Xerox one way or the other. "We haven't counted out Xerox by any means. Their concept is good and such things as [Apple Computer, Inc.'s] Lisa and its network are still not comparable to the Star and Ethernet. Xerox just hasn't done a good enough advertising job on it," she added.

According to Bengston, Arco has four major concerns relating to OA. The company is looking for significant progress in electronic mail, data management, a compatible network and security. Because of the cost-justification issue that surrounds the company's work in the information services area, Bengston believes that users must be educated more effectively as to the potential benefits.

To this end, several pilot programs have been initiated with a focus on education and understanding. The Information Services Council, made up of 50 information services employees, meets three times per year to "focus on a common understanding of the issues." An offshoot of that council, a decision group of eight or nine information service managers, actually makes decisions on the planning and implementation of programs.

At the Executive Briefing session, 25 Arco top executives discuss "what's coming in the future and how to prepare for it," according to Bengston. This is in addition to the annual Executive Seminar and Management Continuum, where Arco managers discuss all of the company's top priorities, including information processing.

Another pilot project, the Arco Information Services Seminar, began in July. This session was devoted to a more thought-provoking look to the future of computing using case studies rather than how-to teaching methods. These educational endeavors may prove vital for the OA planners.

Smith said he believes the slowdown caused by the economy has actually worked to the advantage of his Cuis group. "It's just as well. The state of the art is changing so fast that it's good to take a long look at what's out there."

The cost for the pilot, including hardware and software, was nearly $280,000, but analysis showed there was an after-tax return of 39% and a payback period of 25 months, thus proving cost-justification.

In its latest venture, Cuis is setting up an information center for the corporate headquarter's treasury department. This is not considered a pilot, however, but a full-fledged implementation. According to Smith, the project includes an HP 3000 minicomputer for financial analysis, data base management, graphics support and WP support. When fully implemented, there will be 25 terminals for 50 people in the department. "This is geared to providing full professional support and to save on time-sharing," he declared.

Both Cuis and the strategic planning groups are concerned that implementation of technology without an overall corporate plan can lead to later incompatibility problems. Bengston said a great deal of bridge-building will be necessary in the future.

McArthur agreed, but said it was unwise simply to wait for an optimum solution. She believes the major concepts of the installed systems won't change all that much and people will be able to adjust to changes more easily when they know the technology.

"We're not going into this with the idea of being incompatible," Smith added. "We've just picked pilots where we could learn something."

It would be impossible, in any event, to wait, according to Cuis. The personal computer is making a strong appearance in corporate headquarters, McArthur pointed out. Cuis receives more than 400 calls per month from current or potential users who want to manipulate data or get access to corporate data bases. "I don't know how many personal computers are out there. We do have 'review' privileges, though. Purchasing likes to see our signature on all office equipment expenditures," she added.

Both Bengston and Smith agreed the future will bring widespread end-user computing. Although he wouldn't place a dollar figure on it, Smith conceded that Arco will spend a "sizable amount" on OA over the course of the decade.

"We've positioned ourselves better than many organizations. Whether we are there or not is a matter of opinion, but we have top management support to position Arco for the 1990s," Cuis' Tom Moreland said. McArthur agrees and said the user population is taking to the new technologies as well: "I'm not sensing resistance at all. Maybe it's because we are basing our implementation on need and the need exists. If anything, people want more." OA

Rifkin is a staff writer for Computerworld OA.

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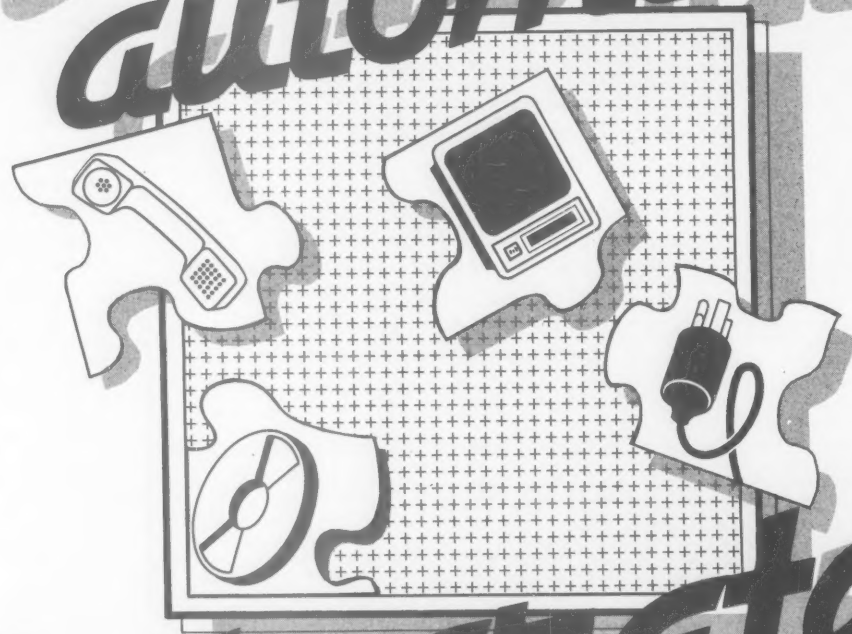

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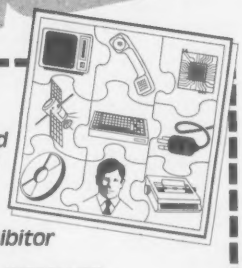

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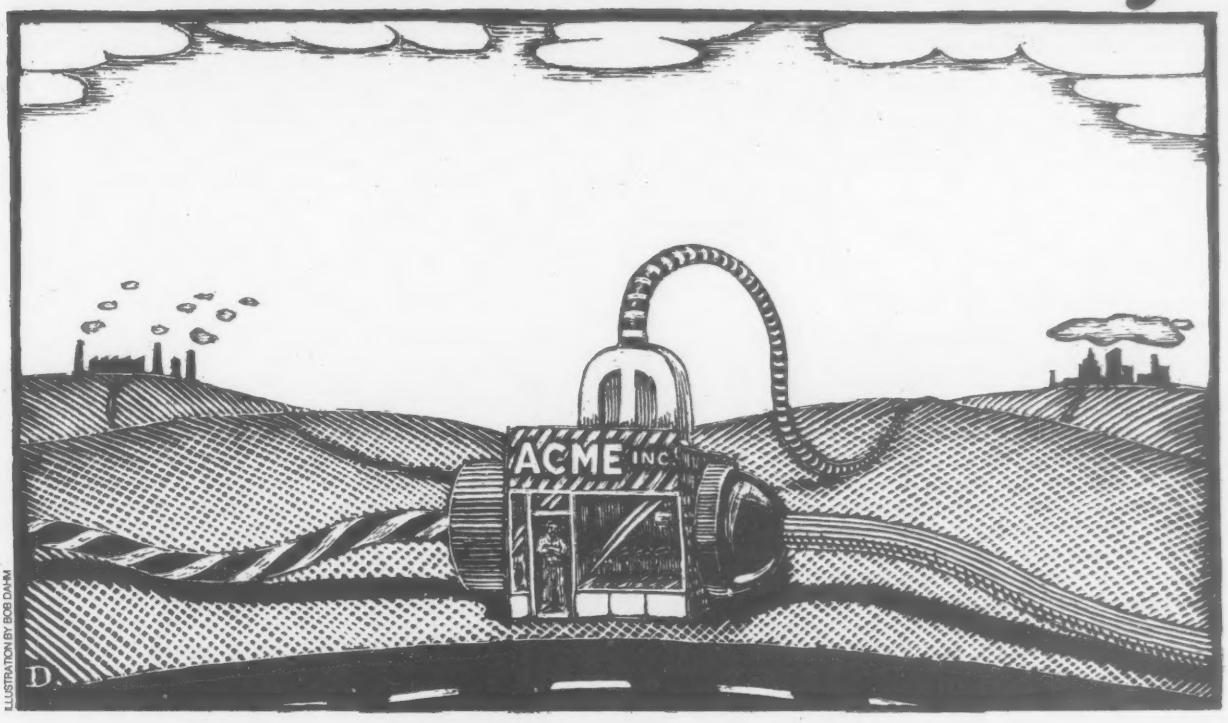

ILLUSTRATION BY BOB DAHM

On-line data bases are rapidly gaining acceptance among a whole new group of users.

By John Markoff

Georgia Finnigan is a hired gun in the Information Age. Her company is The Information Store and her business card simply reads "Competitive Intelligence."

Housed on the fifth floor of a brick building below Market St. in the San Francisco financial district, the Information Store is one part of the fabled Information Age most of us haven't heard of before. Finnigan is an information broker. Brokering information is a growth industry in today's "on-line" society, in which electronic data bases are proliferating as fast as daily newspapers are closing.

What are information brokers? They are the Sam Spades of the network nation. Got a question? Want to find an expert witness for a trial? Need to know about electric power line vandalism, or maybe about the impact of video game usage? Ask an information broker, and there's a good chance he can ferret out the answer for you.

Finnigan's secret is that she and her researchers use on-line data bases the way most other people use the public library. Finnigan's searchers are skilled at using technical tools to coax arcane information from vast data bases housed in inaccessible mainframe computers.

There is another secret, however. The proliferation of personal computers is rapidly breaking down barriers that previously existed to using on-line data bases. Until recently, special programming skills and obscure query languages were needed to get at electronic information.

Market researchers estimate that the installed base of business, scientific and educational personal computers will reach more than 4 million by the end of 1983. At the same time, big on-line data base makers are finally waking up to the fact that this will be their biggest market — one they have tended to ignore until just recently.

Today's users want more from their systems. Traditionally, personal computers have come into office settings for two purposes: word processing and electronic spreadsheet functions.

However, the flexibility of a personal computer soon becomes obvious to anyone who uses one. Why not use it as a simple data base management tool — or, more frequently, for sending electronic mail at a low cost? It never seems to take very long before a personal computer is performing five or six tasks in an office setting.

Until now, however, using personal computers as windows onto larger remote data bases has advanced more slowly than other functions. Serious obstacles have included high cost; slow commu-

nications channels, which make acquiring information tedious; and complex software programs, which require special training to master.

Now all this is changing overnight as personal computer users have begun looking for sources from which to gather information electronically. Electronically delivered information differs from other sources of information principally in its greater selectability. Instead of searching through vast libraries, the user of an information utility is able to direct a computer to perform the task instead.

This much is clear about information utilities, but perhaps little else is. Today, the information utility business is a reflection of the topsy-turvy growth of both the personal computer and the communications industries. Personal computer users can subscribe to information utilities being run by companies as diverse as publishing houses, newspapers, banks, an aerospace contractor, a tax accounting firm and soon even from TV networks and the phone company.

The subject matter in the data bases is astonishingly diverse. Scientific data for petroleum engineers, United Press International world news, the race records of 900,000 thoroughbred horses foaled since 1920 and information of use to sausage makers are all available.

The new information industry that has emerged is now also known by a potpourri of names: information utility, videotex, teletext and viewdata, to name just a few.

Not only are the sources of electronic information dissimilar, so are the means of transmission. Your information utility may be received by telephone line, cable TV network, radio and TV transmission and now even by satellite broadcast. Little wonder that this new industry is surrounded by confusion!

Yet despite the disarray and even in the midst of a recession, information utilities have continued to blossom. The Source, now owned by the giant Reader's Digest Corp. and with a recent major investment from Control Data Corp., continues to add 2,000 new subscribers each month. Dow Jones News & Retrieval Service, long a mainstay of the financial community, is widely advertised as being profitable and is considered the financial success story of the information utility industry. More recently, two traditional suppliers of on-line data bases to large corporations and institutions, Lockheed Dialog and BRS, have decided enough personal computers exist to warrant special information utility services.

Mike Rawl of The Source in McLean, Va., noted that people who have purchased a personal computer traditionally wait between nine months and a year before deciding to subscribe to an information utility service. The Source is now seeing the fallout from the current personal computer boom.

At the same time large corporations have begun to explore and market electronic information services, grass roots systems have also begun to spring up. Called electronic bulletin boards, these systems are usually software programs running on home computers that allow users to connect to others over phone lines and leave messages or even upload and download professional quality software.

For the office and professional user, on-line data bases are now tailoring services for personal computer users. Both Lockheed Dialog and BRS, two major data base suppliers, have recently begun offering subsets of their larger data bases for evening and weekend use at greatly reduced cost. Dialog's Knowledge-Index can be accessed after 6 p.m. weekdays and anytime during the weekend. It offers users more than 7 million summaries of articles, reports and books on topics that focus on business, computers, electronics, medicine and other subjects. Although this is only a small fraction of the entire Dialog data base, one data base of special interest indexes and abstracts on a daily basis the *New York Times*, *Wall St. Journal* and *Christian Science Monitor*, as well as more than 300 popular periodicals.

So far, the first Knowledge-Index users have been from business and education markets and from a number of doctors, according to Barbara Gersh, Dialog's acting director of marketing. Knowledge-Index officials said they are still only considering expanded services such as electronic mail. However, BRS, another on-line data base that in the past has been targeted principally toward large institutional users, has also started BRS After Dark, which it has aimed at home computer users. It will soon be offering electronic mail.

Targeted more directly at the information needs of the office is Newsnet, a data base started in 1982. It now offers on-line 110 electronic newsletters from 50 independent publishers. The newsletters cover such fields as telecommunications, electronics and computers, fiber optics and satellite news. The full text of the newletters is reproduced and every meaningful word is indexed. Users can read full text, scan headlines and search for keywords through all or part of the data base.

Another service, Newsflash, lets users monitor new issues that are just being released. It is possible to preselect phrases and let the computer watch for them and alert the user.

The most successful information utility is Dow Jones News/Retrieval, which is now used for obtaining stock market quotations by many brokers around the country. Dow has agressively marketed the service to personal computer users, bundling subscriptions in with software that users purchase. The Dow Jones service includes 20 data bases broken down into four tiers: business and economic news; stock quotes; financial and investment services; and general news and information services, including United Press International.

One of the more interesting on-line data base services now available is a recent joint venture by Data Resources, Inc. (DRI) and Visicorp, maker of the Visicalc electronic spreadsheet. It is now possible to purchase a special software program from Visicalc to allows you to download economic and other data and then manipulate it off-line on a personal computer. The range of information includes general economic forecasts and data on specific industries.

In another recent phenomenon, groups of professionals who have never used computers before have begun to get into the act. In the space of one recent week, two different organizations located in Manhattan announced they were starting personal computer-based information and communications networks for professional photographers. One group, Photo-1, focuses on photojournalists and attempts to combine electronic mail and data base services that will help photo researchers quickly locate pictures. Photo-1 is the brainchild of Rick Smolan, a professional photojournalist and the editor of a best-selling photo book, *A Day In The Life Of Australia*. The Photo-1 project currently has the support of the *Washington Post*.

"One obvious use of the network will be to aid in coordinating freelance photo assignments. It would be very useful for a photojournalist on assignment in a foreign country to be able to log in with a portable computer or terminal and get timely information on where to get film processes, which are the safe borders to cross and where the best places are to eat," Smolan noted.

Personal computer users can subscribe to information utilities being run by companies as diverse as publishing houses, newspapers, banks an aerospace contractor, a tax accounting firm and soon even from TV networks and the phone company.

The second photographers' network came about because of Len Kaltman's experiences several years ago when he was a partner in a New York City picture agency. Kaltman began using a Radio Shack Model II personal computer to ease the burden of keeping track of his agency's photos. Before long, his customers began asking, "Can we get this information from you on-line?" He thought about the requests for awhile, and they seemed to make sense.

Recently Kaltman introduced the Photonet network, an information utility for photographers, advertising agencies, graphic designers and publishers. Located in New York, Photonet is based on an IBM mainframe computer and was designed to allow users services such as electronic mail, news and electronic shopping. The system will also offer special services such as on-line typography via a gateway to another system.

According to Kaltman, Photonet was designed for photographers who have absolutely no computer experience. It will include bulletin boards for different industry specialties and will also include its own on-line magazine, *Photonet Magazine*, which will offer news on trends and technology as well as monthly features, editorials, interviews and opinion pools. Kaltman is confident that the network will be seized upon by organizations that need to coordinate film and video projects spread in many locations around the country.

Neither of the new information utilities feel they are competing. "We're different channels on a new type of TV," Smolan said.

By putting this kind of information at the fingertips of photographers, whose on-location offices frequently consist of their camerabags, portable computer networks are giving a new and more practical meaning to the office of the future. OA

Markoff is a senior editor at Infoworld *newpaper.*

Ecom – How Special The Delivery?

By Pat Carrell

The lure of electronic mail is obvious: to move information from one place to another in a faster, more efficient way than was previously possible. Most conventional delivery methods cannot offer same-day delivery. Some notable exceptions include the telephone conversation — if the recipient can be reached — and Western Union's Telex/TWX and Telegram services.

Computer-based electronic mail is an important breakthrough for people who need fast textual information flow. One of the more controversial systems has been the Electronic Computer-Originated Mail (Ecom) system from the U.S. Postal Service. But what exactly is Ecom and how does it relate to other systems?

Electronic mail as we know it today had its roots in Western Union's Telex message-oriented service. When the TWX service was acquired by Western Union in 1971, it soon became possible for Telex and TWX units to communicate with each other. Mailgram was launched in 1972 by Western Union in cooperation with the U.S. Postal Service. Messages received at Western Union's computer centers are sent, via land lines and satellite, to one of several serving post offices nearest the recipient, where the message is printed out and delivered by letter carrier the next day.

The latest development in electronic mail revolves around using computers to control the transmission of textual information. Development in this area involves all forms and sizes of computers including mainframes, minis, micros, word processors and personal computers; the ultimate goal is a network of communicating computers of various types.

Computer-based electronic mail systems can be subdivided into three basic types: communicating word processors, in-house systems and remote computing services.

Electronic mail service on communicating word processors is quite rudimentary in some cases. In others, however, local networks are possible for the creation and transfer of text information. Incompatibility among foreign devices, unfortunately, limits the extent to which communicating word processors can be used for electronic mail purposes.

Many possibilities exist for adding in-house computerized electronic mail functions. Special software capabilities can be secured, or a complete computer system with electronic mail functions can be purchased. Many companies now using some form of electronic mail system have simply upgraded their existing computer systems.

Remote computing services allow companies that do not have their own computer to implement electronic mail with subscribers sharing an off-site computer. A broad range of remote computing services is available, beginning with a data terminal that can communicate over telephone lines to a computer. These remote services can provide sophisticated electronic mail services without the need for expensive computer equipment.

The Ecom service is one such computer-based electronic mail service.

This service officially began in January of 1982 and, based on user reactions, Ecom will probably be enhanced and expanded.

Years were spent by the Postal Service on investigating the possibility of offering electronic mail services for the use of private business or the general public. The initial motivation for developing electronic mail sprang from a general dissatisfaction with the deficiencies of the U.S. Postal Service. The Postal Service also recognizes the possibility of slower growth or even reductions in mail volumes as a result of new technology, including telephone, electronic funds transfer and electronic message systems, as well as alternative forms of delivery.

The Ecom service fulfills the Post Office's need to process certain categories of mail faster and to do so without posing an unacceptable threat to private electronic mail industry, according to the Post Office. Private industry has tended to disagree, however. Ecom emerged as a long-range electronic mail strategy resulting from an extensive study done for the Post Office by RCA, which also developed and installed the hardware system for Ecom.

The use of electronic mail by the USPS provided a means for cutting back on the enormous expenses it incurs to keep the 100 billion pieces of first-class and third-class mail moving. An additional incentive came from the Postal Reorganization Act of 1970, which called for the USPS to become self-sufficient. Even though the Postal Service has historically received significant financial bolstering from the federal government, it has been operating in the red since 1945. When fully mature, the electronic mail service will be capable of handling between 25 billion and 50 billion pieces of mail annually, which is from 25% to 50% of the total yearly volume for the USPS. During the first year of Ecom service, nearly seven million pieces of mail were transmitted.

Volume mailers that generate mail from data stored in electronic form can utilize the Ecom message system at any of the 25 serving post offices. Electronic messages sent to the proper serving post office locations are transformed into hard copy, enveloped and delivered. Mailers can transmit Ecom messages within two days, 24 hours a day, seven days a week.

The Ecom service consists of acceptance of input, processing, distribution and delivery. A USPS processing station handles a variety of input forms from magnetic tape, floppy diskettes or directly from customer-owned devices like word processors, data terminals and facsimile units. Hard-copy information may also be hand-carried to the center for input via facsimile and optical character recognition devices while a customer waits.

A variety of computer/communications software protocols at different data transmission rates are provided at the 25 serving post offices. Transmission rates range from 300 bit/sec to 56K bit/sec. Protocols include X.25, Digital Equipment Corp.'s DDCMP, 2780, 3780 and Ecom-A asynchronous. Both Ascii and Ebcdic codes are available. Access to the serving post office can be via public dial-up lines or via dedicated leased point-to-point lines. Access may also be direct from the customer to the serving post office or indirect via value-added common carriers.

In addition to the particular data communications protocol used, Ecom requires the user to enter a prescribed sequence of commands to effect transmission. When transmission is complete, Ecom returns a message indicating the submission has been accepted and filed for subsequent processing. A user must have a terminal device capable of preparing Ecom messages off-line and storing these messages until they are submitted to the serving post office. A modem links the terminal to the public network.

Each serving post office has a unique telephone number for each protocol and data rate. The Ecom user must select the num-

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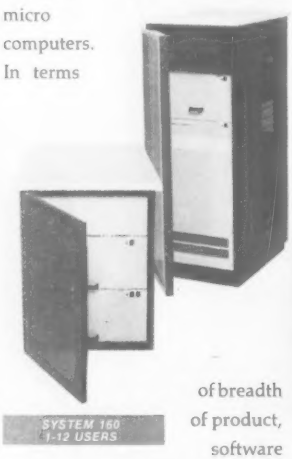

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ber that accommodates the protocol and data rate being used. Input for delivery is accepted until 5 p.m., when the material is organized and prepared for transmission.

Public carriers of the Ecom service must open and maintain an advanced deposit account with the Postal Service at an annual cost of $50. This gives the sender an identification number and access code which authorizes transmission of properly prepared messages to any or all serving post offices. As a customer uses Ecom, the Postal Service deducts the appropriate charges from the advanced deposit account and provides a monthly statement of usage.

Postage rates depend on the number of pages in the message. It costs the sender 26¢ to send a one-page letter, and a two-page letter costs 31¢. This charge includes paper, the envelope, labor for preparing the mailing and delivery. This compares quite favorably to the Mailgram, which typically ranges from $1.00 to $1.90. Depending on input method and length, however, Mailgram prices could be as low as 80¢ per message and as high as $4.65.

Before any messages in a submission are accepted, the balance in the customer's (sender's) account must be sufficient to cover the postage for the entire submission. If the balance is too low, the customer is called and given the option of either making a payment or cancelling the message submission.

The serving post offices communicate the electronic mail to other processing stations through a combination of satellite and Bell Digital Data Service links. Electronic mail is then output through the use of nonimpact electrostatic printers onto computer fanfold paper, inserted into envelopes and given to postal workers, who then deliver them in the usual manner.

As previously mentioned, a mailer can enter messages directly to the Postal Service or indirectly through a carrier acting as the mailer's agent. In the indirect relationship, the carrier will transmit the messages to the serving Post Offices and may provide such services as protocol or format conversion or the consolidation of messages from several smaller mailers to achieve the minimum required for Ecom access. At the present time, a minimum of 200 messages per transmission per serving post office is required.

For many mailers, using value-added or indirect carriers may be better, even though the cost can be somewhat higher. Relatively low volume may not warrant going through the rigorous certification process and training required to become certified as a carrier. On the other hand, if a company expects to use the Ecom service on a regular basis, the effort required to become certified is probably well worthwhile.

For mailers interested in securing certification, a value-added carrier could prove extremely useful. Guidance from the Post Office is not yet extensive, and the operator manuals may not answer all questions. A value-added carrier could, therefore, assist a potential mailer in both preparing for certification and learning the various Ecom formats and procedures — a time-consuming effort at the very least.

The USPS classifies correspondence into three distinct categories:

- Single Address Messages, where each letter has unique text.
- Common Text Messages, where the only unique aspect of the letter is the name and address.
- Text Insert Messages, where there is a common message with some unique text insertions, such as a balance due. Any combination of these categories

A TESTIMONIAL FOR THE BURROUGHS B20 FROM SOMEONE WHO SPENT 17 YEARS AT IBM.

Dr. W. LEE SHEVEL
Senior Vice President, Corporate Operations, Burroughs Corporation

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can be included in a 200-letter minimum transmission.

Ecom service users are utilizing it for a variety of applications including the mailing of promotional materials; product announcements; policy, product and price change notifications; collections; billing; and field surveys. As a direct mail tool, Ecom has been able to save mailers several days of routine processing time. Besides speed, Ecom users believe the blue-and-white envelopes in which Ecom letters are placed command attention and, consequently, result in high readability.

By the end of August 1982, 600 firms had applied for certification; of those, about 70% would be direct users. The USPS estimated that by the end of 1982, more than 100 customers would be certified to transmit Ecom messages.

However, Ecom does have some limitations. At the present time, some smaller mailers find the 200-message minimum requirement prohibitive. Although not yet available, when the insert capability becomes an option, firms such as banks and retailers will use Ecom to mail statements and bills so that postage-free business reply envelopes can be inserted for such things as bill paying, proxy statements from stockholders and mail-order requests.

Another limitation results from the current use of dot matrix printers. They are somewhat limited in terms of speed and quality and do not allow the printout of signatures and logos.

In its first year of operation, improvements have already been made. The certification process to enable applicants to gain access to the system more quickly has been simplified. Ecom sales and service representatives, who provide technical and support services to customers, have been increased.

Other improvements such as the insert capability may be incorporated into the system sometime in 1983. This task should not be too difficult, since the equipment already has the capability. Another change under consideration includes the introduction of laser printers to increase potential output above the current level of 365,000 messages daily. Before the end of 1983, Ecom officials would also like to offer corporate users the option of including their logos on Ecom messages. Volume over the next year is expected to increase considerably, and the USPS is attempting to be in a position to meet increased demands.

Since its inception, Ecom and the USPS have been under considerable attack. Many believe Ecom is a threat to a dynamic, growing, private industry that has proven itself capable of satisfying current and future demands for electronic message services. Many also believe that Ecom is deeply subsidized from other Postal Service revenues as well as the taxpayer, so an increase in Ecom rates will be inevitable and substantial. This remains to be seen. The service as currently offered and priced is competitive from the mailer's point of view, and it is quicker and cheaper than many alternative forms of mailing.

As Ecom's first year of operation draws to a close, its users seem to agree they got more than they were promised. They describe it as a fast, reliable and inexpensive service they plan to use even more in the future. If the current plans for enhanced service are implemented, it would seem reasonable to expect many more users will get on the bandwagon. OA

Carrell is a consultant in the OA industry and has done work with both vendors and end users of OA systems.

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MicroRIM
Data Base Management Software for Microcomputers

WESTBORO, Mass.— **Data General Corp.** entered the microcomputer field with its Desktop Generation Series, a family of systems designed to be compatible with both industry-standard software and DG's own 16-bit and 32-bit superminicomputer software.

The new family includes models 10, 10/SP, 20 and 30. The series reportedly runs MS-DOS- and CP/M-86-based industry application software as well as DG's own MP/AOS, Rdos and AOS minicomputer operating systems software; operates as an individual workstation; can support up to four users concurrently; and can be used as a stand-alone system or as a node in a larger computer network.

The Desktop Generation Series will be available for between $3,165 for the basic Model 10 up to $17,030 for the Model 30, the vendor said.

DG also announced several other products, including three new vendor software interfaces. The interfaces include an IBM Personal Computer Dasher emulator, CEO Information Management support on Northern Telecom's Displayphone and the CEO Page Reader for document input from both Compuscan, Inc. and Dest Corp. optical character recognition devices.

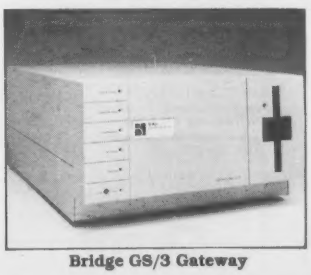
DG Desktop Generation

Also added to the CEO product line was a decision support spreadsheet, CEO Compucalc, and several new CEO word processing features.

The IBM Personal Computer Dasher emulator has a license fee of $150. The CEO Information Management Support on the Displayphone will be available as part of CEO Information Management at no extra charge. The CEO Page Reader will be licensed at $2,500 from DG, 4400 Computer Drive, Westboro, Mass. 01581.

CUPERTINO, Calif. — A network gateway device said to link as many as eight remote Ethernet networks using common point-to-point connection media has been introduced by **Bridge Communications, Inc.**

The GS/3 Internetwork Router is a communications processing system that supports from two to eight communications lines, with a maximum aggregate data rate of 304K bit/sec when fully configured. The GS/3 is a full implementation of the Xerox Corp. Network System transport protocols.



Bridge GS/3 Gateway

The GS/3 is priced at $9,900 with one serial I/O board (two communication lines) from Bridge Communications, Inc., 10440 Bubb Road, Cupertino, Calif. 95014.

CANTON, Mass. — Leading Edge Word Processor, a word processing software package for the IBM Personal Computer, was introduced by **Leading Edge Products, Inc.** The package reportedly gives the IBM Personal Computer capability that matches or exceeds that of a dedicated word processor. It is said to be faster and more efficient because its commands are compressed into fewer keystrokes.

The company indicated this is the first of many software packages it will develop for the IBM Personal Computer and other compatible micros. Leading Edge Word Processor will be available for less than $300, the vendor said, from Leading Edge Products, 225 Turnpike St., Canton, Mass. 02021.

SANTA CLARA, Calif. — **Convergent Technologies, Inc.**'s multifunction, distributed intelligence workstations now can run standard MS-DOS and CP/M-86 operating systems hosted by its proprietary operating system, Ctos, the vendor said.

Under Convergent's hosted implementation, CP/M and MS-DOS applications can coexist with Ctos applications in the same cluster of Convergent workstations, sharing the same resources — for example, files and peripherals.

Available through Convergent OEMs, the MS-DOS and CP/M implementations cost $600 each for a full support license and $200 each for a use-only license. More information is available from Convergent Technologies, 2500 Augustine Drive, Santa Clara, Calif. 95051.

SAN JOSE, Calif. — **Dest Corp.** introduced a high-performance, desktop optical character recognition page reader designed to reduce the time required to read typewritten documents into word processors, computers, communications systems and typesetters.

The Model 203 Turbofont is an addition to Dest's Workless Station Series 200. The new model reportedly has twice the speed of the other models, reading up to 250 pages per hour.

The Model 203 Turbofont is priced at $9,995 from Dest, 2380 Bering Drive, San Jose, Calif. 95131.

WEST CHESTER, Pa. — **Commodore Business Machines, Inc.** introduced a portable computer, the Executive 64. The portable has 64K bytes of random-access memory, a detachable keyboard, built-in 6-in. color monitor and a single floppy disk drive with 170K-byte capacity. The unit weighs 27.6 lb and is reportedly briefcase size.

The Executive 64 is said to be fully compatible with the company's VIC 20 and C-64 peripherals. Using a Zilog, Inc. Z80 cartridge, the Executive 64 can accommodate a Digital Research, Inc. CP/M operating system or, with a PET emulator, can use much of the available PET software, the vendor said. The portable is available for $995 from Commodore Business Machines, 1200 Wilson Drive, West Chester, Pa. 19380.

Commodore Executive 64

LOWELL, Mass. — Several product announcements and enhancements have been made by **Wang Laboratories, Inc.** The company introduced the VS Express, a network and remote office support system for Wang's Virtual Storage product family. The package combines tools, such as memos, phone messages, distribution lists, "to do" lists and calendars, in a ready-to-use form.

Wang also announced several enhancements to its Professional Computer, including a host of communications offerings, a local Professional Computer network, a voice attachment, the UCSD-P runtime support system, an enhanced version of Wang's word processing and system software and additions to Wang's family of software products.

In addition, Wang announced an agreement with **Visicorp** giving Wang exclusive marketing rights to Visicalc Advanced Version for the 16-bit Wang Professional Computer. Under terms of the agreement, Wang will be responsible, through its newly established Distributed Software Program, for the physical distribution, licensing and promotional activities associated with the marketing of the second-generation electronic spreadsheet program.

More information is available from Wang Laboratories, One Industrial Ave., Lowell, Mass. 01851.

ATLANTA — A local-area processing network for office automation applications has been introduced by **Lanier Business Products, Inc.** The new system includes word processing, electronic filing, personal computing, electronic mail and management decision support.

The network is based on Lanier's new OM network processor, which will be available in 8-, 16- and 32-bit architectures. The basic configuration, including the network processor, seven workstations and printers, will be available for approximately $55,000, the vendor said.

Lanier also announced the EZ-2 Work Processor, a one or two workstation option product designed to support a distributed work group environment; new WP software, called One-Step, for its OA line; and a color workstation, the LCGWS-100.

More information is available from Lanier Business Products, 1700 Chantilly Drive, N.E., Atlanta, Ga. 30324.

MORRISTOWN, N.J. — **American Bell, Inc.**'s Advanced Information Systems Division announced Release 2 of its Dimension System 85, along with two new terminals for the voice/data PBX. Release 2 adds a new 501CC processor and reportedly offers nearly eight times the line capacity of Release 1, announced in January.

The new terminals include the 515 Business Communications Terminal (BCT), an integrated voice/data workstation that accesses the system's voice, messaging and office functions and compatible hosts; and the 513 BCT, an asynchronous data-only display terminal.

A 400-line configuration of Release 2 is priced at $429,203, the vendor said; with distributed communications capabilities and 6,200 lines, the price is $5.3 million. The 515 BCT costs $3,385, and the 513 terminal costs $2,020 from American Bell Advanced Information Systems, 100 Southgate Pkwy., P.O. Box 1955, Morristown, N.J. 07690.

UNION, N.J. — **Linkdata, Inc.** introduced a value-added IBM microcomputer that runs Digital Equipment Corp. commercial software. Through the development of the Link-DOS operating system, Linkdata will market the IBM Computer System 9000 capable of running the full range of DEC Dibol software.

Linkdata IBM 9000

Utilizing the Motorola 68000 microprocessor, Linkdata's IBM 9000 reportedly can support up to 16 users and a variety of disk subsystems. The packaged system will initially be available with 25M bytes of Micro-Winchester storage, the vendor said.

A sample configuration consisting of 25M bytes of storage, three screens and keyboards, matrix printer with Link-DOS operating system and Dibol compiler will cost less than $23,000 from Linkdata, 2005 Rt. 22, Union, N.J. 07083.

RYE BROOK, N.Y. — **IBM** has announced a series of software packages that provide its Displaywriter text processor with business graphics and enhanced 3270 emulation capabilities. The new business graphics package, called Chartpak, reportedly allows Displaywriter users to create,

update, display and print bar, line, pie and free-form charts.

The 3270 Attached Workstation program permits the Displaywriter to emulate the abilities of the company's 3278 display terminal and 3287 printer when the Displaywriter is connected by coaxial cable to the 3274 and 3276 control units, according to the vendor.

The Chartpak product is scheduled for October and will cost $550. The 3270 emulation package carries a one-time charge of $800 and is scheduled to be available in September.

IBM also announced it is dropping the price of the Displaywriter by 24% when purchased as a stand-alone system and by 30% when it serves as part of a printer-sharing configuration. More information is available from IBM, 900 King St., Rye Brook, N.Y. 10573.

SANTA BARBARA, Calif. — **Santa Barbara Laboratories, Inc.** introduced a "keyboardless" color executive terminal said to feature touch-screen data access, windowing and voice control of data entry and editing functions.

Users interact with the system by touching one of the screen images. Response time is less than one second, according to a vendor spokesman.

The system uses multiple processors, 1M byte of main memory and an 80M-byte data base to support information handling, voice processing and telephone operation. The average price of a workstation is $25,000, the vendor said.

More information is available from Santa Barbara Development Laboratories, 22 Anacapa St., Santa Barbara, Calif. 93101.

ALLEN, Texas — **Intecom, Inc.** announced its integration of an open architecture voice message system, Intemail, for all models of the IBX voice/data communications system.

In addition to having current voice store-and-forward messaging capabilities, Intemail includes such additional features as automatic call answering, automatic voice message desk, message-waiting indication, multiple levels of message review and Namescan.

The Intemail system will be available in the first quarter of 1984 and, in its smallest configuration (including eight ports and 16 hours of storage), will reportedly cost just less than $100,000.

More information is available from Intecom, from 601 Intecom Drive, Allen, Texas 75002.

STAMFORD, Conn. — **Exxon Office Systems Co.** introduced two communications enhancements to its Exxon 500 Series Information Processor. The first enhancement reportedly

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allows the processor to emulate the IBM 3278 Model 2 terminal and provide increased asynchronous communications capability. The second enhancement, the Async II, is a communications package that can convert both incoming and outgoing code sets for specific vendors, the vendor said.

The Exxon 3270 Emulation software costs $300. Async II is also available for $300 from the firm at 777 Long Ridge Road, Stamford, Conn. 06902.

SANTA CLARA, Calif. — Five software products, part of a recently announced distributed digital network for office automation and telecommunications, were introduced by **Rolm Corp.** The products are the VL Rolm Net, the Traveling Class Mark, Off-System Station Forwarding, Password and the Unchecked Forced Account Code.

The VL Rolm Net and Traveling Class Mark come as one package with a basic price of $20,000. The Off-System Station Forwarding package costs between $800 and $2,700, depending on size. The Unchecked Forced Account Code has a price range of $2,200 to $10,000 from Rolm, 4900 Old Ironside Drive, Santa Clara, Calif. 95050.

SANTA CLARA, Calif. — **Intel Corp.** introduced its Data Pipeline, a hardware and software package designed to link mainframe computer data bases with personal computers. The Data Pipeline is built around Intel's Data-Base Information System, Idis 86/735, a microcomputer "traffic manager" that interprets, stores and distributes mainframe data to and from terminals and personal computers. Intel's Idis 86/735 Data Base Information System sells for $34,995 from Intel, 3065 Bowers Ave., Santa Clara, Calif. 95051.

NATICK, Mass. — **Prime Computer, Inc.** has announced its first microcomputer-based workstation designed specifically to work with its Series 50 minicomputer and Office Automation System (OAS).

The desktop Producer 100 is based on the Convergent Technologies, Inc. Application Workstation under a recently announced agreement. The workstation offers 384K bytes of main memory and an Intel Corp. 8086 microprocessor. It uses a 5¼-in. disk drive for mass storage, with a capacity of 630K bytes.

The workstation is available starting at $7,900 from Prime Computer, Prime Park, Natick, Mass. 01760.

BLUE BELL, Pa. — **Sperry Corp.** introduced an enhanced version of its Sperrylink office system Desk Station. The new version includes a low-profile diskette subsystem with a detached keyboard and a character printer, according to the vendor.

The Sperrylink Desk Station Model 30 reportedly features local processing and memory along with the 8439 Diskette Subsystem and the 0431 printer. The basic price of a Sperrylink Desk Station is $3,530. A typical clustered system serving a department of 15 end users would average $8,552 per workstation, the vendor said. Sperry can be reached through P.O. Box 500, Blue Bell, Pa. 19424.

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CALENDAR

Aug. 24-25, New York — **Integrating Word Processing and Data Processing.** Also, Sept. 21-22 and Oct. 11-12, New York. Contact: Datamation Institute, Suite 415, 820 Boylston St., Chestnut Hill, Mass. 02167.

Sept. 12-13, New York — **Strategic Planning for Information Systems.** Contact: Datamation Institute, Suite 415, 820 Boylston St., Chestnut Hill, Mass. 02167.

Sept. 12-14, Washington, D.C. — **Word Processing Systems: Planning, Design and Operation.** Contact: Datapro, 1805 Underwood Blvd., Delran, N.J. 08075.

Sept. 14-15, New York — **Voice Processing: The Dynamic Surge Into the Office.** Contact: Probe Research, Inc., P.O. Box 590, Morristown, N.J. 07960.

Sept. 14-16, Washington, D.C. — **Data Communications for Microcomputers.** Contact: Datapro, 1805 Underwood Blvd., Delran, N.J. 08075.

Sept. 19, New York — **Business Graphics.** Contact: Datamation Institute, Suite 415, 820 Boylston St., Chestnut Hill, Mass. 02167.

Sept. 19-21, Chicago — **Introduction to Office Automation: Concepts, Technology and Applications.** Also, Los Angeles, Sept. 26-28; Philadelphia, Oct. 12-14. Contact: Datapro, 1805 Underwood Blvd., Delran, N.J. 08075.

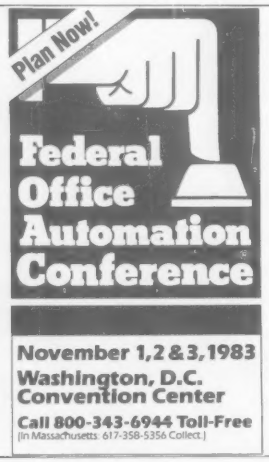
Sept. 19-21, Chicago — **Improving Office Productivity: Principles and Practices.** Contact: Datapro, 1805 Underwood Blvd., Delran, N.J. 08075.

Sept. 19-23, Paris, France — **Ifip '83 Ninth World Computer Conference.** Contact: Dorn Computer Consultants, 25 E. 86th St. New York, N.Y. 10028.

Sept. 22, New York — **Decision Support Systems.** Also, Oct. 13, New York. Contact: Datamation Institute, Suite 415, 820 Boylston St., Chestnut Hill, Mass. 02167.

Sept. 25-28, San Diego — **Business Communications: Challenges for the '80s.** Contact: International Data Corp., 5 Speen St., Framingham, Mass. 01701.

Sept. 26-28, New York — **Fundamentals of Data Communications.** Contact: American Management Associations, P.O Box 319, Saranac Lake, N.Y. 12983.



Sept. 26-28, Washington, D.C. — **Office Automation: Strategic Planning, Design and Implementation.** Contact: Datapro, 1805 Underwood Blvd., Delran, N.J. 08075.

Sept. 27-28, New York — **Data Communications: Concepts/Management Overview.** Contact: Datamation Institute, Suite 415, 820 Boylston St., Chestnut Hill, Mass. 02167.

Sept. 29-30, New York — **Local-Area Networks: Selection Guidelines.** Also, San Francisco, Sept. 29-30. Contact: Datapro, 1805 Underwood Blvd., Delran, N.J. 08075.

Oct. 12-14, New York — **Distributed Systems Design: Micros to Mainframes.** Contact: Datapro, 1805 Underwood Blvd., Delran, N.J. 08075.

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